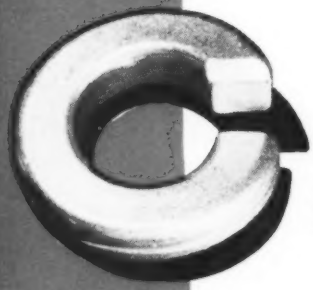
Engineering *and* Maintenance

STRONGER RAIL JOINTS *Decrease* Rail End Maintenance

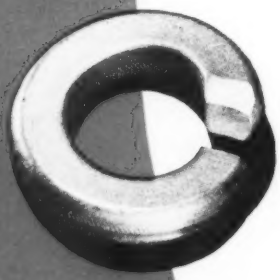
Edgemark of Quality

Tension There in Spite of Wear

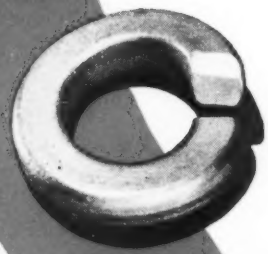
Improved Frog and Crossing Hy-Crome Spring Washer. Developed to meet a long-felt need to efficiently service frog and crossing bolts.



Hy-Crome Pressure Spring. Meets Southern Pacific 1943 revised specifications, exceeding all A.R.E.A. specifications in reactive pressures.

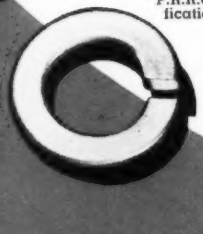


Xtra-hy Hy-Crome Spring Washer. Meets 1948 A.R.E.A. specifications.



Hy-Pressure Hy-Crome Spring Washer. Exceeds 1933 A.R.E.A. specifications.

Standard Hy-Crome Spring Washer. The pioneer of round edge alloy-steel spring washers. Meets 1933 A.R.E.A. specifications.



Hy-Reaction Hy-Crome Spring Washer. Meets P.R.R.C.E. 7. D. Specifications.

Hy-Crome Springlox. A new type of railroad spring washer possessing unusual reaction and other features. Ask us about it.

Locomotive Hy-Crome. Especially perfected to meet the service demands of steam, diesel, electric locomotives and heavy equipment.

the RELIANCE hy-crome curve of greater reaction reduces maintenance costs

- using Reliance Hy-Crome Spring Washers on track joint bolts is a step toward economical and efficient track maintenance.
- each Reliance Hy-Crome Spring Washer has been developed as a result of almost forty years of service experience and close cooperation with railroad maintenance engineers. Each is designed and precision fabricated to meet exacting demands of high speeds and heavy axle load traffic.
- a welcome awaits you at our booth No. 178-179 at the Track Supply Convention to talk over your track joint fastening problems with our representatives.

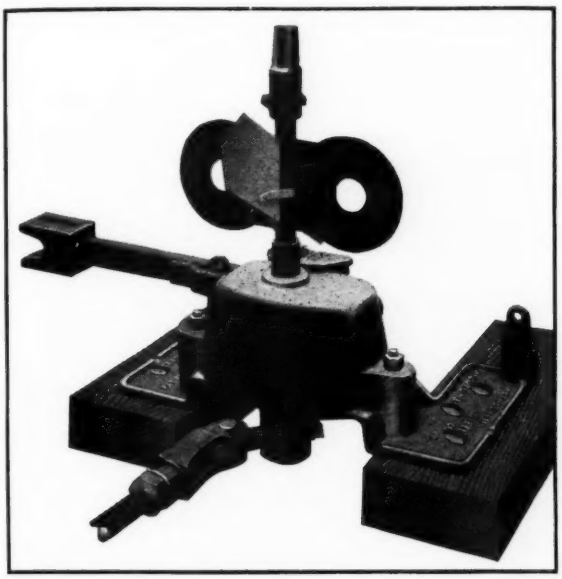
EATON

EATON MANUFACTURING COMPANY RELIANCE DIVISION, MASSILLON, OHIO

Sales Offices: New York, Cleveland, Detroit, Chicago, St. Louis, San Francisco, Montreal

SO SIMPLE!

(Just three moving parts in Bethlehem's 53 Switch Stand)



The Model 53 is furnished in two types—low, as shown here, and intermediate, equipped with mast extension.

Working parts of the Model 53. This view shows details of throwing arm, sliding block, and spindle.

A stand with one of the simplest, most effective mechanisms ever devised—that's Bethlehem's Model 53.

It operates on the principle of the sliding block, which turns a grooved spindle whenever the throwing arm is moved. The design makes possible especially high leverage and smooth transmission of power to the screw-eye crank.

There are but three moving parts—throwing arm, sliding block, and spindle assembly. If, after long service, the block shows evidence of wear, it can easily be turned 90 degrees to place fresh surfaces in contact with the spindle groove.

The Model 53 is easy to throw, and because of its simplicity, virtually no maintenance is required. Investigate this powerful, rugged stand, which is recommended for both main-line and heavy yard duty. A study of its features will emphasize the points cited above—and other good ones of interest to you.

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

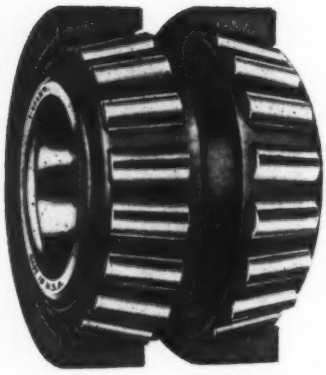
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

Export Distributor: Bethlehem Steel Export Corporation

Published monthly by Simmons-Boardman Publishing Corporation, 79 W. Monroe St., Chicago 3, Ill. Subscription price: United States and Possessions, and Canada, $2.00 for one year; $3.00 for two years. Single copies 50 cents. Entered as second-class matter January 20, 1933, at the post office at Chicago, Ill., under the act of March 3, 1879, with additional entry at Marion, Ind., post office. Address communications to 79 W. Monroe St., Chicago 3, Ill. Volume 46, No. 9.

CARRIES EIGHT HUSKY MEN *COMFORTABLY AND SAFELY* ON TIMKEN® BEARINGS

Manufactured by Fairmont Railway Motors, Inc., Fairmont, Minnesota.



Timken two-row bearings as used on Fairmont A3 Series D car axles.

Actual load capacity 2,000 pounds — men or materials. This Fairmont A3 Series D doubles in B & B and extra gang car service. Equipped with a 17 H.P. engine, 4-speed transmission and Timken tapered roller bearings on all axles, it performs with efficiency and economy.

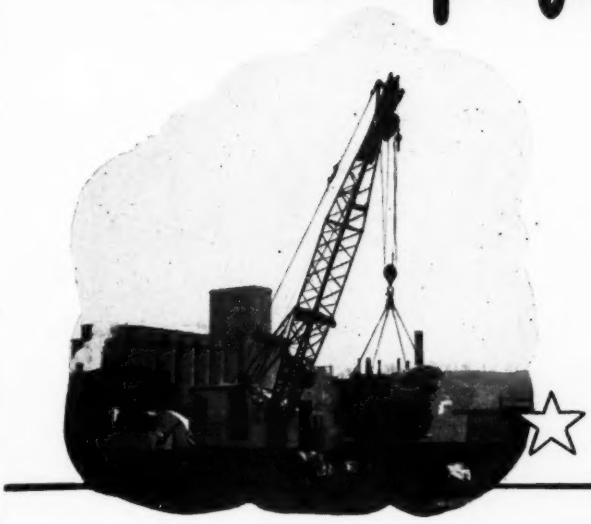
Timken bearings reduce friction to the minimum; carry radial, thrust and combined loads; help to hold shafts in alignment and protect them against wear. And because they are made of Timken alloy steel — the finest material ever developed for tapered roller bearings — they usually last for the life of any equipment in which they are installed. Make sure you have them in your equipment. Look for the trade-mark "TIMKEN" on every bearing.

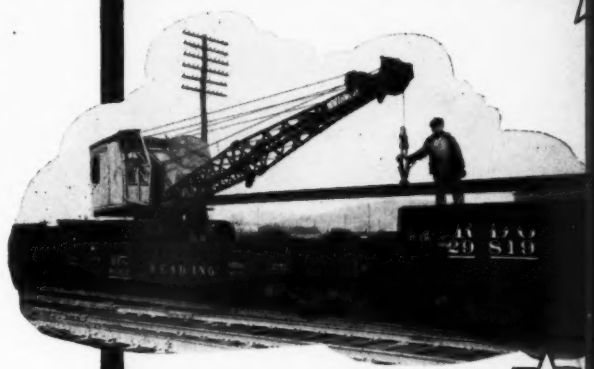
THE TIMKEN ROLLER BEARING COMPANY
CANTON 6, OHIO - CABLE ADDRESS "TIMROSCO"

TIMKEN
TRADE MARK REG. U.S. PAT. OFF.
TAPERED ROLLER BEARINGS

NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▱ BEARING TAKES RADIAL ▯ AND THRUST ⊣▯⊢ LOADS OR ANY COMBINATION ✳

The star performer on every railroad job!

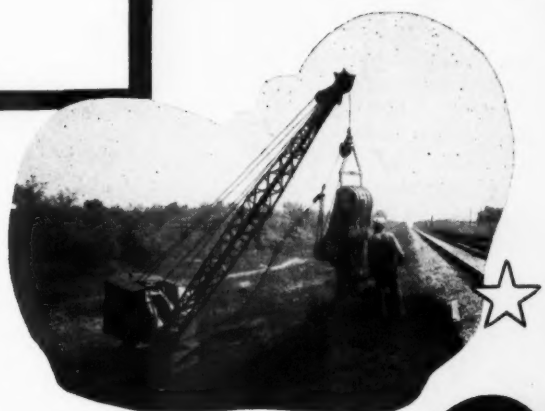


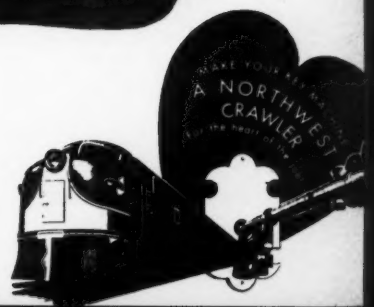


WEIGH *all* the features in the Shovel, Crane, Dragline, or Truck Crane you intend to buy! Remember that it takes more than one feature to make a piece of equipment profitable to you. It isn't a type of crawler, a type of control or a type of drive that you want. It is high output! That's what saves money—and you want the combination of advantages that makes high output possible.

Weigh all the features in the equipment you are considering. Other equipment you will find is often spoken of as "A Good Crane", "A Good Dragline", or "A Good Shovel" but Northwest is universally recognized as a leader whether operating as a Shovel, Crane, or Dragline. You can't have Northwest advantages unless you have a Northwest!

NORTHWEST ENGINEERING CO.
1513 Field Bldg., 135 South LaSalle Street, Chicago 3, Illinois



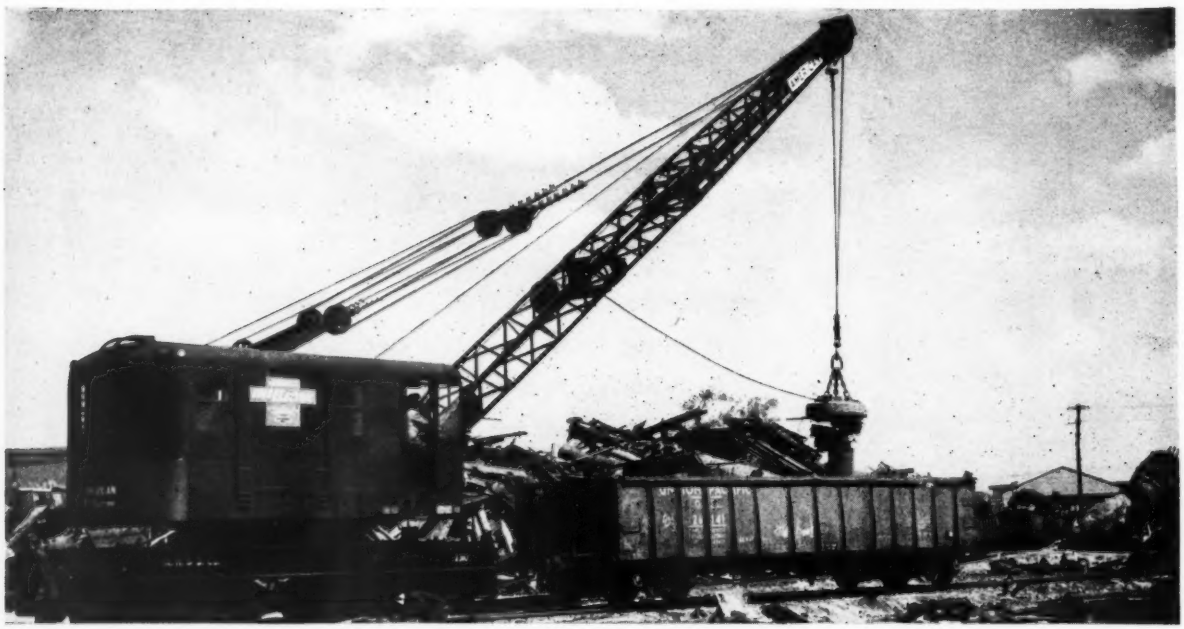


NORTHWEST

THE ALL PURPOSE RAILROAD MACHINE

What's your job?

- ☐ Tie handling
- ☐ Pile driving
- ☐ Track re-locating
- ☐ Bridge building
- ☐ Ballast handling
- ☐ Emergency fueling
- ☐ Rail setting
- ☐ Materials handling
- ☐ Pole setting
- ☐ Stockpiling
- ☐ Scrap handling
- ☐ Yard service
- ☐ Car shop work
- ☐ Switching operations
- ☐ Cinder loading
- ☐ Heavy lifting
- ☐ Wrecking service
- ☐ Locomotive coaling
- ☐ Right-of-way maintenance
- ☐ Construction jobs
- ☐ Freight transfer



An American DiesELectric does them all...and more!

● You might, of course, do all of the jobs listed above with an old style steam crane. Or, for that matter, on some of them you could probably use mule teams. But would you make any money for your railroad?

Today's biggest news, in the field of railroad work-power, is the American DiesELectric Locomotive Crane. It does *all* the big, tough, heavy jobs at top speed and rock bottom cost. It *makes money* on every one of these operations.

With a DiesELectric on the tracks, you start work in the morning just by pushing a button. You work with magnet, bucket, hook or other tackle. You can push the crane at top speed for hundreds of hours, if you need to. You have diesel power to the deck, electric power to the wheels—the greatest power-speed-smoothness combination ever developed. One man runs this crane. And when he shuts it down at night, all costs are instantly stopped.

Available in a wide range of sizes and capacities. Mail the coupon for fully descriptive catalogs.

American Hoist
& DERRICK COMPANY
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Plant No. 2: SO. KEARNY, N.J.
Sales Offices: NEW YORK • PITTSBURGH • CHICAGO

American Hoist & Derrick Company 31 5614
St. Paul 1, Minnesota

● Please send catalog on ____ ton American DiesELectric Locomotive Cranes.

*Name*_____

*Company*_____

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*City*_____ *State*_____

HOW TO Handle a Variety of Jobs on a Single, Lower Investment

—USE THE **Allis-Chalmers HD-5G and Tracto-Shovel Interchangeable Attachments***

You can build up shoulders — place ballast — handle ties — transport and lay rail — dig, carry, dump and spread any kind of material — build and maintain access roads — remove brush — plow snow or load it — cut costs on dozens of other jobs — all with this standard machine and one or more specially designed attachments. Start now to stretch your budget . . . investigate!

The HD-5G Tractor is available with semi-grouser, full grouser and rubber-faced track shoes as well as the flat shoes shown above.

The Most Advanced Tractor in its Power Class . . . . .

BIG WORK CAPACITY—This completely new smaller tractor has big tractor design, balance and stamina . . . surprises users everywhere with its performance. As owners say, "You've got to see it to believe it."

JUST THE RIGHT SIZE—to efficiently handle a wide variety of jobs. Has 11,250 lb. of properly balanced weight (tractor bare) . . . 40.26 drawbar hp. provided by the smooth-running, economical, 2-cycle GM Diesel engine—every down stroke a power stroke!

NEEDS LESS GREASING THAN AN AUTOMOBILE — Instead of hitting a dozen or more grease fittings every shift, you lubricate only one fitting every two weeks, two other fittings every five weeks (based on 40-hour weeks). *And you operate a full 1,000 hours* before replenishing lubricant in truck wheels, track idlers and support rollers.

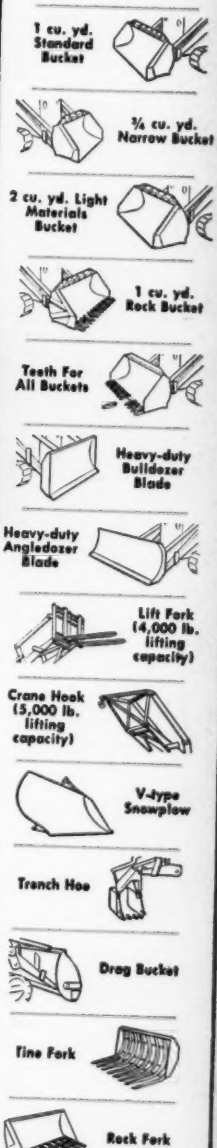
SIMPLE TO SERVICE—All adjustments are unusually accessible. Major assemblies are removable without disturbing unrelated parts — engine, clutches, transmission, etc. There's less downtime — more time working . . labor and repair costs are reduced.

BUILT-IN SAFETY AND CONVENIENCE—Easier steering and shifting with convenient controls, full vision. Cushioned seat, wide arm rests. Operator gets more done because it's easier to do more!

Write for literature or ask your Allis-Chalmers dealer for a demonstration!

*These 14 Tracto-Shovel Attachments

Can be Interchanged in but a Few Minutes

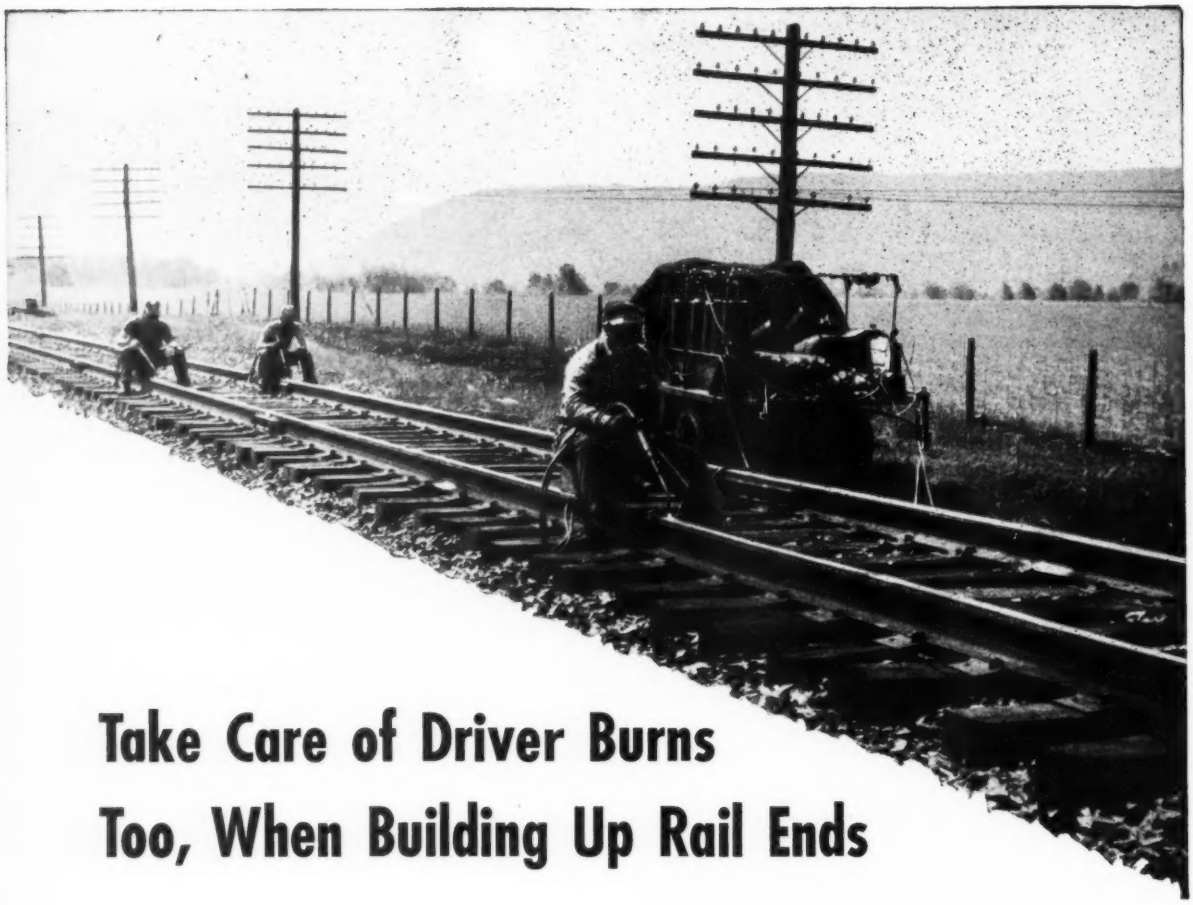


The usefulness of the HD-5 Tractor is further widened by other allied equipment: 2-wheel scrapers, rippers, rollers, cranes, skid loaders, canopies, winches and log carts.

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

For Greater Production . . . For Easier Operation . . . For Simplified Servicing

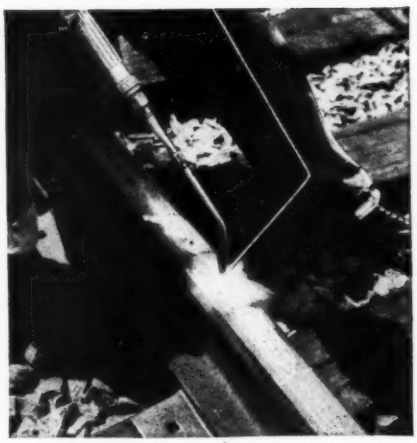


Take Care of Driver Burns Too, When Building Up Rail Ends

When your rail-end welding gangs are out on the job, driver burns can be repaired at the same time. Manpower, tools, and supplies are all on hand to do both jobs.

The pictures show how driver burns are removed by a large Eastern railroad. The gang shown is one of several out on the line using OXWELD MW rod to build up rail ends and eliminate driver burns. Frequent checks with the rail detector car in the last five years have shown that the original soundness of the rail has been restored.

For details on how this procedure can be adapted to your track programs write for Form 7448.



Here's how easily driver burns are built up with OXWELD MW rod.

The term "Oxweld" is a registered trade-mark.

THE OXWELD RAILROAD SERVICE COMPANY
Unit of Union Carbide and Carbon Corporation
UCC
Carbide and Carbon Building Chicago and New York
In Canada:
Canadian Railroad Service Company, Limited, Toronto

OXWELD RAILROAD SERVICE

SINCE 1912—THE COMPLETE OXY-ACETYLENE SERVICE FOR AMERICAN RAILROADS

SAVES time and manpower! . . . . Starts and stops easily! . . . . Well-balanced design reduces operators' fatigue.

Force of blow proven to produce proper compaction effect, hard enough to pack ballast firmly but does not crush it!

It's the NEW TARWATER Electric Tamper.

The only **NEW** *development in tampers in recent years*

See the TARWATER Electric Tamper in action at the Coliseum, Chicago, September 18, 19, 20.

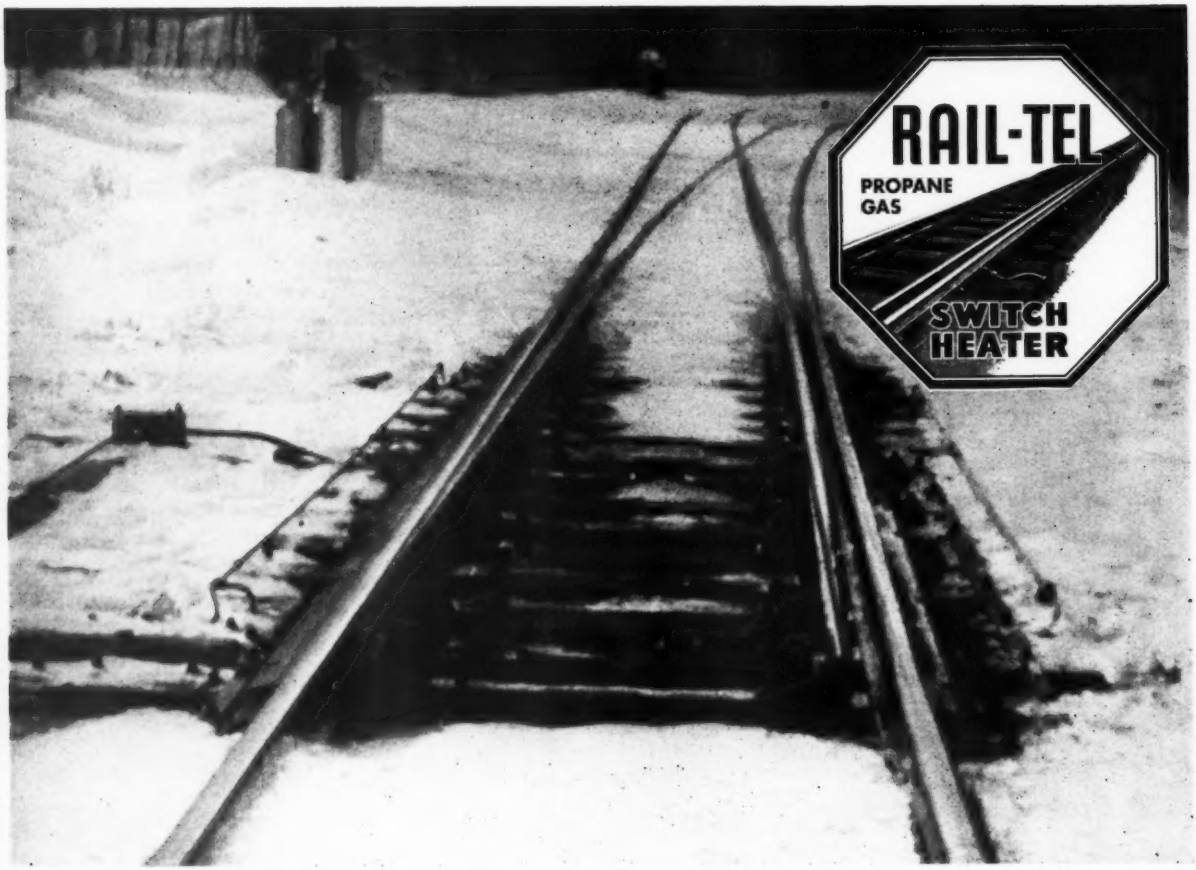
Tarwater Electric TAMPER

Check these advantages exclusive with the TARWATER Electric Tamper:

Light Weight	Weighs only 48 pounds—no heavy load factor.
Easily Portable	Plugs into any portable high-cycle generator or convertor. Two to four tampers may be operated from a single generator, covering unlimited working areas.
Quick Tool Changes	Simple design of tool holder permits easy mounting and removal of tools.
Efficient Electric Motor	Compact and light, yet sturdy and reliable; power starts or stops instantly at the flip of a switch.
More Punching Power	Up to 1800 blows per minute.
Self Lubricating	Perfected lubrication seal permits safe operation up to 400 hours without attention.
New Low Cost	Purchase price, with power plant added, is appreciably lower than other tampers. The low maintenance cost of TARWATER Electric Tampers makes them doubly economical.

Let us arrange a demonstration at your convenience, —on your own right of way.

Manufactured by **TARWATER RAILWAY SUPPLY CO., Redlands, California**



Low Cost Winter Protection For Switches

Control box and supply cylinders for Rail-Tel remote control installation.

The past two critical winters have proved the efficiency and economy of propane gas in keeping switches free of snow and ice. Rail-Tel installations on representative roads are responsible for important savings.

Now is the time to prepare for unhampered operation in the months ahead. Rail-Tel Switch Heaters provide unfailing, economical protection in busy terminals and yards and out along the line—particularly where C.T.C. territory is involved. Available in both manually operated and remote controlled assemblies, these heaters are ruggedly built and easy to install. Write for complete information.

THE RAILS COMPANY

General Office
178 GOFFE STREET, NEW HAVEN 11, CONN.

ST. LOUIS, MO. HOBOKEN, N. J. CHICAGO, ILL.

NEW Pettibone Mulliken TRAK-KLEENER

Does Work of 200 Men

Rear view of TRAK-KLEENER proceeding down center of track removing and discharging refuse material into cars of work train on adjoining track.

The winged scraper of TRAK-KLEENER funnels refuse dirt into path of dragger-back blades which speeds it onto the conveyor belt and into work car.

TRAK-KLEENER is an "off-track machine." Its big 13:00x24 tires make it easily maneuverable in and across yard track or uneven terrain.

FAST • THRIFTY • THOROUGH

Fluid Drive • Hydraulic Crowding • Self Feed • Self-Propelled

The new Pettibone Mulliken TRAK-KLEENER offers many operating features such as:

- Cleans and loads at speeds varying from 0' to 80' per minute.
- Operates faster than any other method and reduces tie-up of tracks to a minimum.
- Leaves a clean, level floor . . . a great asset for drainage and safety of yard crews.
- Loading capacity: 5 - 8 cubic yards of loose material per minute . . . averaging 3 carloads per hour.
- Operated by one man.
- Drastically cuts loading (idle) time of work train.

ALL SEASON USEFULNESS!

Loading from Stock Piles
Excavating and Digging
Leveling
Snow Removal

Visit

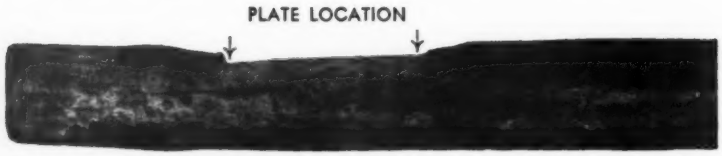
The PMCO TRAK-KLEENER Exhibit
Booths No. 31 to 36
Track Supply Association Convention
Chicago Coliseum
September 18, 19 & 20

Since 1880

PETTIBONE MULLIKEN CORPORATION

4700 West Division Street, Chicago 51, Illinois

WHAT HAPPENED to a Railroad Tie WITHOUT any Tie Pad



This creosoted hardwood tie was installed on a main line curve on a grade without a pad beneath the tie plate. The photograph is of the inner end of the tie and shows plate cutting of .56 in. after 8 years of service.

-and WITH a Resilient Tie Pad

This creosoted hard wood tie was installed near the one above, with one of our resilient tie pads made of cotton and rubber used beneath the plate. The Photograph is of the inner end of the tie. Plate cutting amounted to only .06 in., a reduction in wear, from the tie shown above, of 89%, after 8 years of service.

You Can See THESE TWO TIES at

THE TRACK SUPPLY ASSOCIATION AND THE BRIDGE BUILDING & SUPPLY MEN'S ASSOCIATION

SEPTEMBER 18-19-20

IN CHICAGO

Visit Our Booth

173-174

On bridges, switches, curves and station track the use of Fabco Tie Pads is economically sound. No better method exists to prevent mechanical wear of ties, extend tie life and cut the high costs of tie maintenance.

Write for latest Information

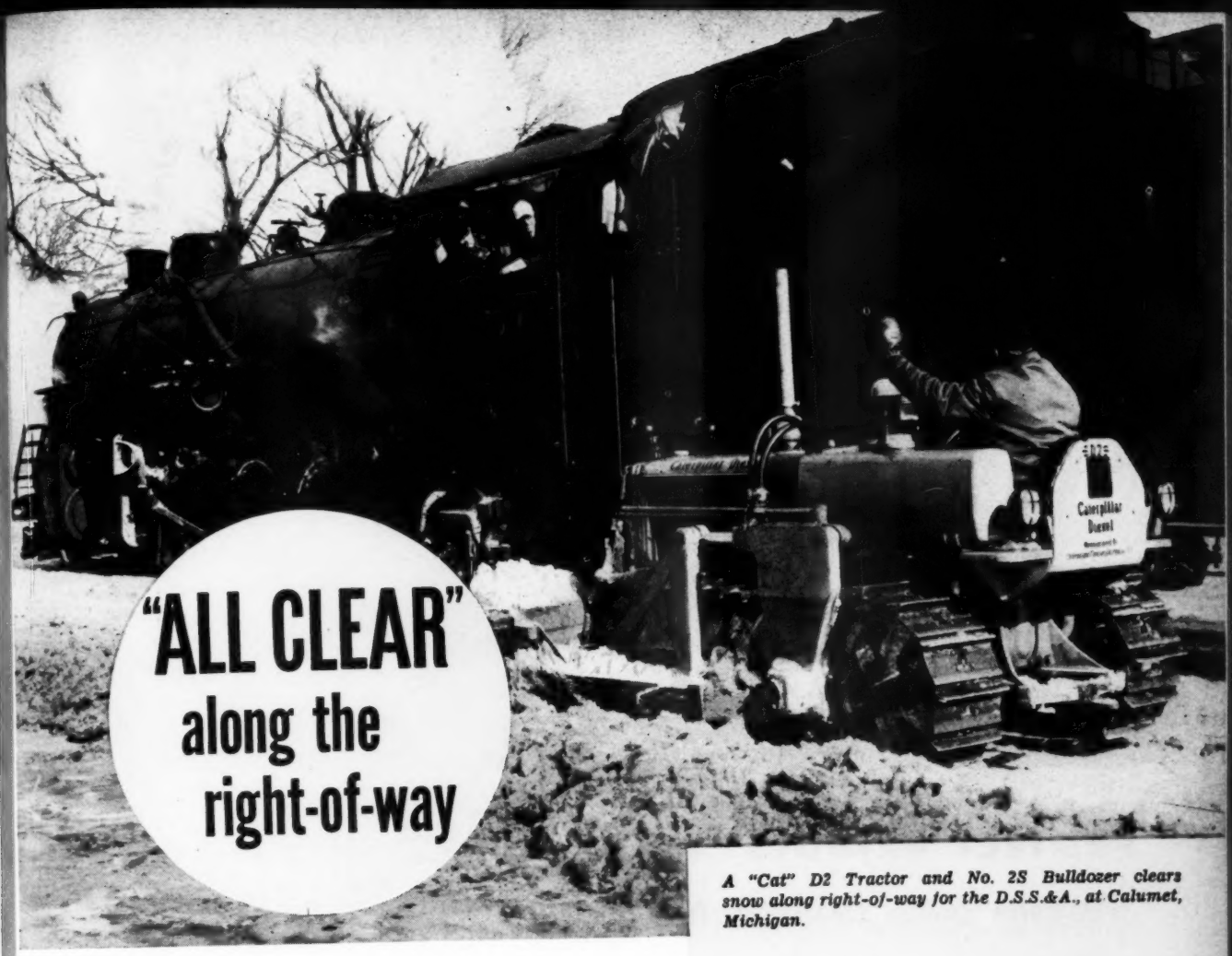
FABREEKA PRODUCTS COMPANY
Incorporated
222 M Summer St., Boston 10, Mass.

NEW YORK CHICAGO DETROIT
PHILADELPHIA SPARTANBURG, S. C.
OAKLAND, CALIF.

ON BRIDGES, SWITCHES, CURVES AND STATION TRACKS

It Pays to Specify FABCO TIE PADS

WRITE US TODAY



"ALL CLEAR" along the right-of-way

A "Cat" D2 Tractor and No. 2S Bulldozer clears snow along right-of-way for the D.S.S.&A., at Calumet, Michigan.

In an area where the annual snowfall runs between 160 and 230 inches, deep drifts along the tracks and in the yards make real trouble for railroads.

The Duluth, South Shore and Atlantic Railway operates a "Caterpillar" D2 Tractor and No. 2S hydraulic Bulldozer to clear snow from the tracks and open up freight and passenger loading areas at Calumet, Michigan.

Kept busy at this job all winter, the work of the "Caterpillar" D2 Tractor and 'Dozer doesn't end when the snow melts. In spring, summer and fall this husky unit does double-duty in off-track maintenance.

"Caterpillar" Diesel Tractors are tough and durable, built to start in the coldest weather and stay on the job night and day if necessary. Their long, dependable life is backed by top-notch 24-hour dealer service, available anywhere — any time.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

LOOK UNDER THE HIDE

"Caterpillar" intake and exhaust valves are made of highly alloyed, heat-resistant steels. Their ample size and close machining and heat-treat specifications have resulted in thousands of hours of trouble-free valve operation. Valve and rocker arm design are matched to reduce wear. Look under the hide for long-life quality features. They don't show on the outside—they show up in performance.

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES • TRACTORS
MOTOR GRADERS • EARTHMOVING EQUIPMENT

NO-OX-ID "A special" provides positive, one-coat protection to below-deck areas of bridges.

PROTECT BRIDGES WHERE RUST THREATENS WITH DEARBORN NO-OX-ID "A SPECIAL"

Bridge surfaces that are subject to corrosion that is accelerated by moisture, brine, live coal, cinders and locomotive gases need positive protection.

A completely reliable, thoroughly tested and inexpensive method is Dearborn NO-OX-ID "A Special." It's simple, too. Expensive preparation of metal surfaces is unnecessary . . . you don't need power tools or sandblast equipment. Just wire-brush the surface to remove loose paint film and rust scale. Then brush on a single coat of NO-OX-ID "A Special."

For every problem in rust prevention there is a NO-OX-ID solution. A Dearborn engineer will gladly discuss your problem.

DEARBORN CHEMICAL COMPANY

***General Offices:* 310 S. Michigan Ave. • Chicago 4, Ill.**

Dearborn
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THE ORIGINAL RUST PREVENTIVE

NO – OX – ID
IRON + – RUST

WRITE FOR BOOKLET ON NO-OX-ID

A copy of "NO-OX-ID for Maintenance of Steel Structures in the Railroad Industry" will be sent on request. Mail the coupon.

Dearborn Chemical Company
Dept. RE, 310 S. Michigan Ave.
Chicago 4, Ill.

Please send a copy of "NO-OX-ID for Maintenance of Steel Structures in the Railroad Industry."

Name.....

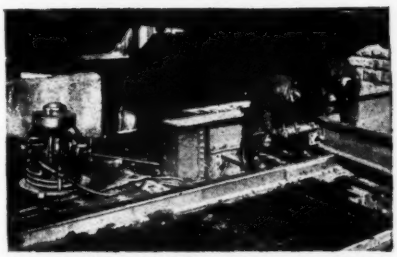
Railroad.....

Address.....

City.....Zone....State....

Ingersoll-Rand SPOT-AIR 3R-36

36 cfm operates four MT-4 Tampers for TRACK MAINTENANCE GANGS



Many bridge and building jobs can be speeded up with the SPOT-AIR and a few air tools.

Rock-breaking and other maintenance of way jobs are easily handled with the SPOT-AIR.

The compactness and lightweight of the SPOT-AIR make jobs in out-of-the-way places easy to get at.

The new SPOT-AIR is the lightest, most compact section-gang compressor of its kind. Its 36-cfm capacity is ample to operate 4 Ingersoll-Rand MT-4 Tie Tampers . . . or a number of other Air Tools used on signal-maintenance, grade-crossing, and numerous emergency jobs.

This 265 pound compressor stands only 32 inches high on a 27-inch baseplate. It is extremely suitable for between-track work under traffic and takes no more space than one man on a section-car.

The self-contained arrangement of three gasoline-engine cylinders and three air cylinders alternately spaced around a vertical crankshaft gives a smooth conversion of engine torque into air power. The 3R-36 is completely air-cooled, thus permitting operation in any kind of weather with no danger of freezing or overheating.

Over 600 smaller-capacity SPOT-AIR compressors, Type 3R-30, have been in successful 2-tamper operation on railroads all over the country during the past two years. The new 3R-36, which delivers full 36 cfm of free air at 80 pounds pressure, has a number of up-to-the-minute improvements which make it the most efficient and easiest to maintain compressor of its type. See your nearest I-R representative for the full story on the SPOT-AIR and Ingersoll-Rand's complete line of Air Power equipment for railway maintenance.

Ingersoll-Rand

11 BROADWAY, NEW YORK 4, N. Y. 564-2

Other Air Power equipment for maintenance of way jobs

SPIKE DRIVERS • GRINDERS • IMPACTOOLS • WOODBORERS • RIVETING HAMMERS • RIVET BUSTERS • BACKFILL TAMPERS • PAVING BREAKERS • PUMPS

NOW! A SUPERIOR METHOD FOR CONTROLLING RAILWAY WEEDS

—Does away with Expensive Hand "Clean-Ups"!

MODERN WEED CONTROL programs must provide over-all efficiency and long-term economy to justify their adoption. Chemicals used today should do the entire job, for labor can no longer be wasted in hand clean-up operations that follow old-fashioned, temporary spray measures.

To get results where ordinary methods fail, investigate General Chemical "TCA"* Formula 7B Weed Killer. This tested, consumer-approved weed killer can provide immediate results *plus* cumulative improvement . . . *at moderate cost!* Weed control with General Chemical "TCA" Formula 7B will help you:

1. Reduce annual work train service
2. Free labor for other important maintenance jobs
3. Reduce operating costs
4. Insure proper roadbed, drainage and good riding qualities
5. Increase safety conditions
6. Reduce frequency of tie renewals and track servicing

YES, THIS MODERN weed killer meets all requirements for improved control. It's different; it's definitely better. Here's why it gives the kind of results you want—

General Chemical "TCA" Formula 7B Weed Killer
GIVES LONG-LASTING RESULTS *plus* LONG-RANGE ECONOMY

- ★ Kills Grasses
- ★ Kills Broad Leaf Weeds
- ★ Penetrates Entire Plant Structure for More Lasting "Kill"
- ★ Suppresses Seed Germination
- ★ Helps Preserve Track Structure
- ★ Aids in Ultimate Sterilization
- ★ Resists Leaching

GENERAL CHEMICAL "TCA" Formula 7B Weed Killer

For detailed information, write to:

Weed Killer Department
GENERAL CHEMICAL DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

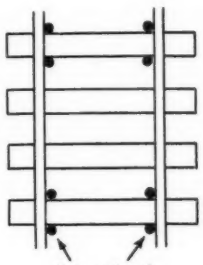
GENERAL CHEMICAL WEED CONTROL

* "TCA" is General Chemical's term denoting formulations contain the free acid of Trichloroacetic Acid only. The water soluble salts are not used in Formula 7B.

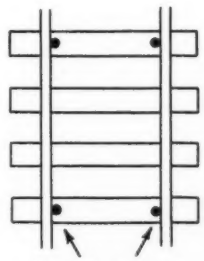
The Time to SAVE MONEY *on Your Track is when it is being* CONSTRUCTED!

In a Mile of Track there are:

- 133 Rail Lengths
- 3,192 Ties
- 6,384 Tie Plates
- 25,536 Track Spikes
- 4,256 Conventional Anchors



Conventional Anchors



Our 1-piece 2-way Compression Anchor

Eliminate Maintenance . . Minimize material costs as outlined below . . .Yet double the lateral strength of your track.

By eliminating 4,256 spikes we save	$ 298.00
By eliminating driving cost of 4,256 spikes, we make a labor saving of	170.24
Saved per mile	468.24
Using Conventional Anchors to accomplish TWO WAY ANCHORAGE requires 4,256 anchors at a cost of	1,276.80
Using the NO-CREEP RAIL ANCHOR to accomplish TWO WAY ANCHORAGE requires 2,128 anchors at a cost of	638.40
In each case above, 8 ties are anchored TWO WAYS. Saved	638.40
Savings in materials and labor per mile of track — Saved on Anchors	638.40
Saved on Spiking	468.24
Saved per mile of track	1,106.64

THE GREATEST SAVING PER MILE OF TRACK IS IN MAINTENANCE

It costs about $0.04 each to knock off, reset and redrive an Anchor. There are 4,256 anchors in a mile of track.

Cost per mile of setting anchors 4,256 x $.04	$ 170.24
Most railroads program this operation twice a year—for summer and winter; so 2 x $170.24 gives cost per mile per year	340.48
Cost for 10 years, per mile	3,404.80
Cost for 100 miles, 10 years	340,480.00

All of this maintenance cost is ELIMINATED WITH THE NO-CREEP Rail Anchor

The combined savings in material, labor and maintenance, over a ten year period are impressive.

Amount of maintenance eliminated	$340,480.00
Amount of materials and labor eliminated	110,664.00
Total Savings—10 years, 100 miles	$451,144.00

The

NO-CREEP

Rail Anchor

is the only fully self-compensating Anchor on the market: it compensates for all weather, TEMPERATURE and Traffic conditions, Continuously. It is self-adjusting; insert it and FORGET IT. Ask the Road Master.

T S A EXHIBIT BOOTH 5N

Write for details.

Phone BALTIMORE 1700

G & H RAIL CONTROLS, INC.

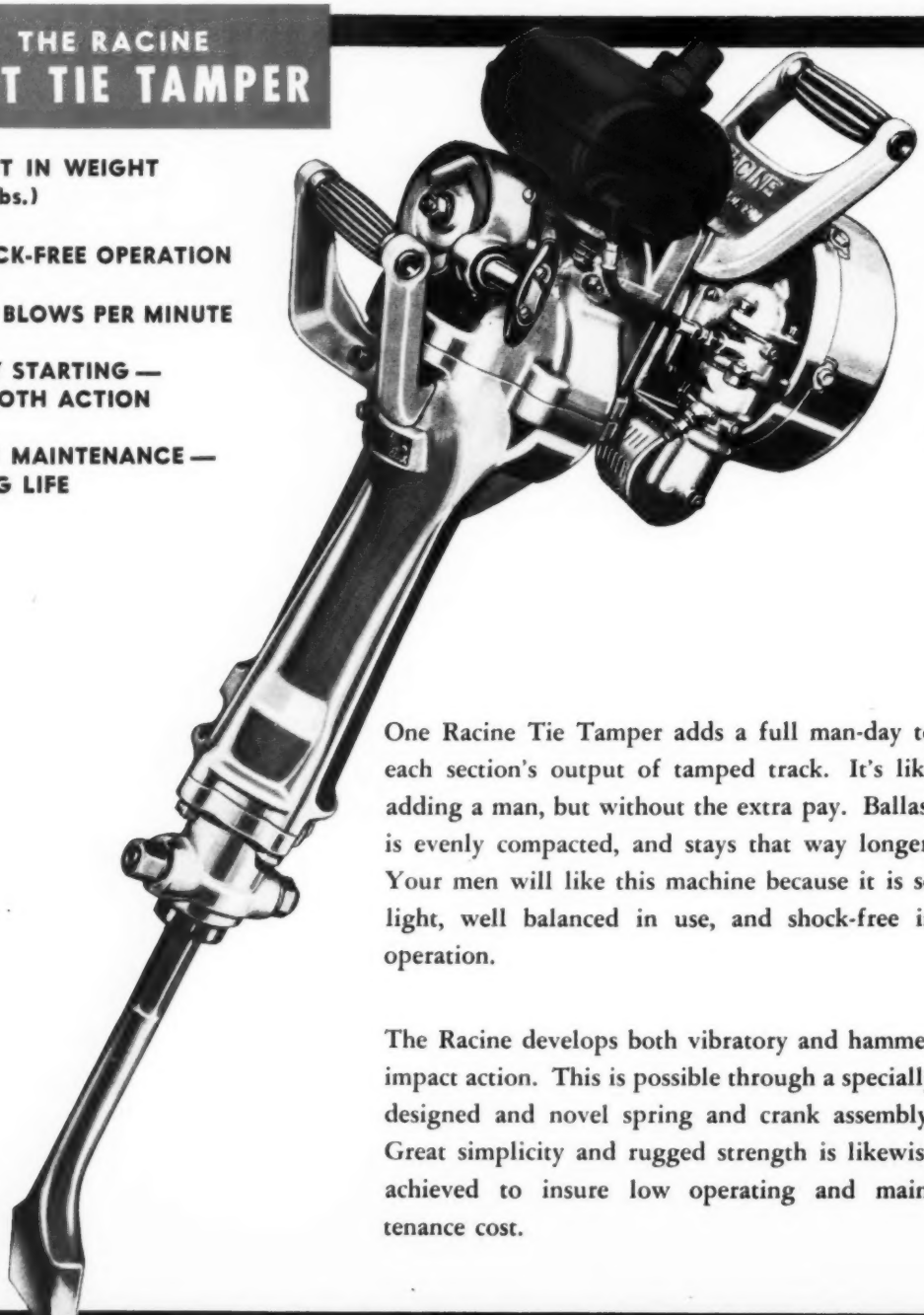
1704-6 Baltimore Ave. Kansas City 8, Mo.

Eastern Representative: Thomas J. Crowley Inc., 230 Park Ave., New York 17, N. Y.
Southwestern Representative: Alfred Engineering and Equipment Co., 515 Cotton Exchange Bldg., Dallas 8, Texas
Western Office: Roy H. Weber Co., 68 Post St., San Francisco 4, California

THESE EXTRA EMPLOYEES

THE RACINE UNIT TIE TAMPER

- LIGHT IN WEIGHT (56 lbs.)
- SHOCK-FREE OPERATION
- 1500 BLOWS PER MINUTE
- EASY STARTING — SMOOTH ACTION
- LOW MAINTENANCE — LONG LIFE



One Racine Tie Tamper adds a full man-day to each section's output of tamped track. It's like adding a man, but without the extra pay. Ballast is evenly compacted, and stays that way longer. Your men will like this machine because it is so light, well balanced in use, and shock-free in operation.

The Racine develops both vibratory and hammer impact action. This is possible through a specially designed and novel spring and crank assembly. Great simplicity and rugged strength is likewise achieved to insure low operating and maintenance cost.

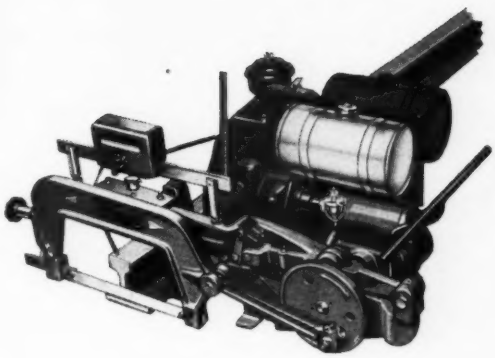
RACINE

WORK WITHOUT PAY!

THE RACINE
PORTABLE RAIL SAW

- CROP RAIL ON TRACK
- CUT OFF ANY LENGTH DOWN TO 1/10"
- WILL NOT SHATTER OR BURN RAIL ENDS
- NO TRAFFIC DELAY OR INTERFERENCE

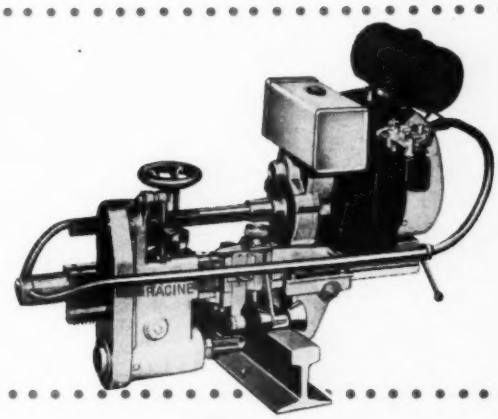
Railroads representing over eighty percent of the track mileage in the United States and Canada are users of the Racine Portable Rail Saw. This machine is the answer to fast, clean-cut, low cost rail cropping. Do the work in the track or at the pile. Simple in design, rugged in construction, easy to use. Two men place the machine on the rail, one man operates it. Smooth saw cuts eliminate the danger of rail fractures that often result from torch cutting or nick and break cropping.



THE RACINE
PORTABLE RAIL DRILL

- LIGHT IN WEIGHT (165 lbs.)
- FITS ALL RAILS
- EASY TO HANDLE
- POWERFUL-FAST

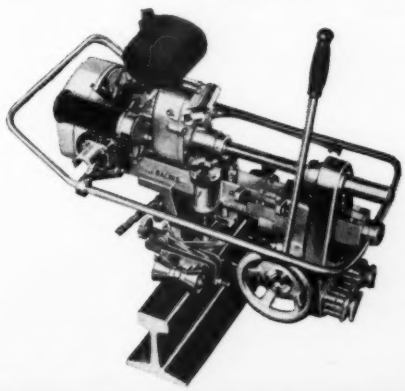
Built to machine tool precision standards, this portable Racine Rail Drill is actually a powerful, compact, horizontal drill press. Light in weight, mounted on rollers, without outboard supports this drill can be handled and operated by one man. Drills finished hole in two minutes or less depending on web thickness. Easily adjusted to position. Complete with Automatic Power Feed.



THE RACINE
PORTABLE BOND DRILL

- LIGHT IN WEIGHT (90 lbs.)
- TWIN SPINDLES
- CONTROLLED HOLE DEPTH
- LEVER AND RACK FEED

Now new precision and truly round holes for rail bond are possible with a power driven bond drill. Securely clamped onto the rail, this easily adjusted machine produces single or twin holes at a maximum rate. One man can handle the Racine and move it along the rail on built-in rollers. Simple in design, easy starting and long-lived, this equipment quickly returns its cost.



TOOL AND MACHINE COMPANY
1738 STATE STREET, RACINE, WISCONSIN

Safeguard Rail Travel with PITTSBURGH SNOLITE White Paint

(Fume-Proof)

Whiter Initially—Stays White Longer

. . . for signs, crossing gates, fences, and cattle guards

TODAY'S schedules require that all types of signs be maintained at new standards for safer operation at higher speeds.

Pittsburgh provides a white finish for this purpose that is whiter initially and provides higher visibility. SNOLITE is a fume-proof durable coating for signs, crossing gates, fences, cattle guards, etc.

SNOLITE dries to a smooth surface of superior whiteness which eventually chalks instead of checking or cracking. Industrial gases and smoke fumes will not darken or discolor it.

Write today for Pittsburgh's new booklet of Railway Structural Finishes. It may help to save you time and money.

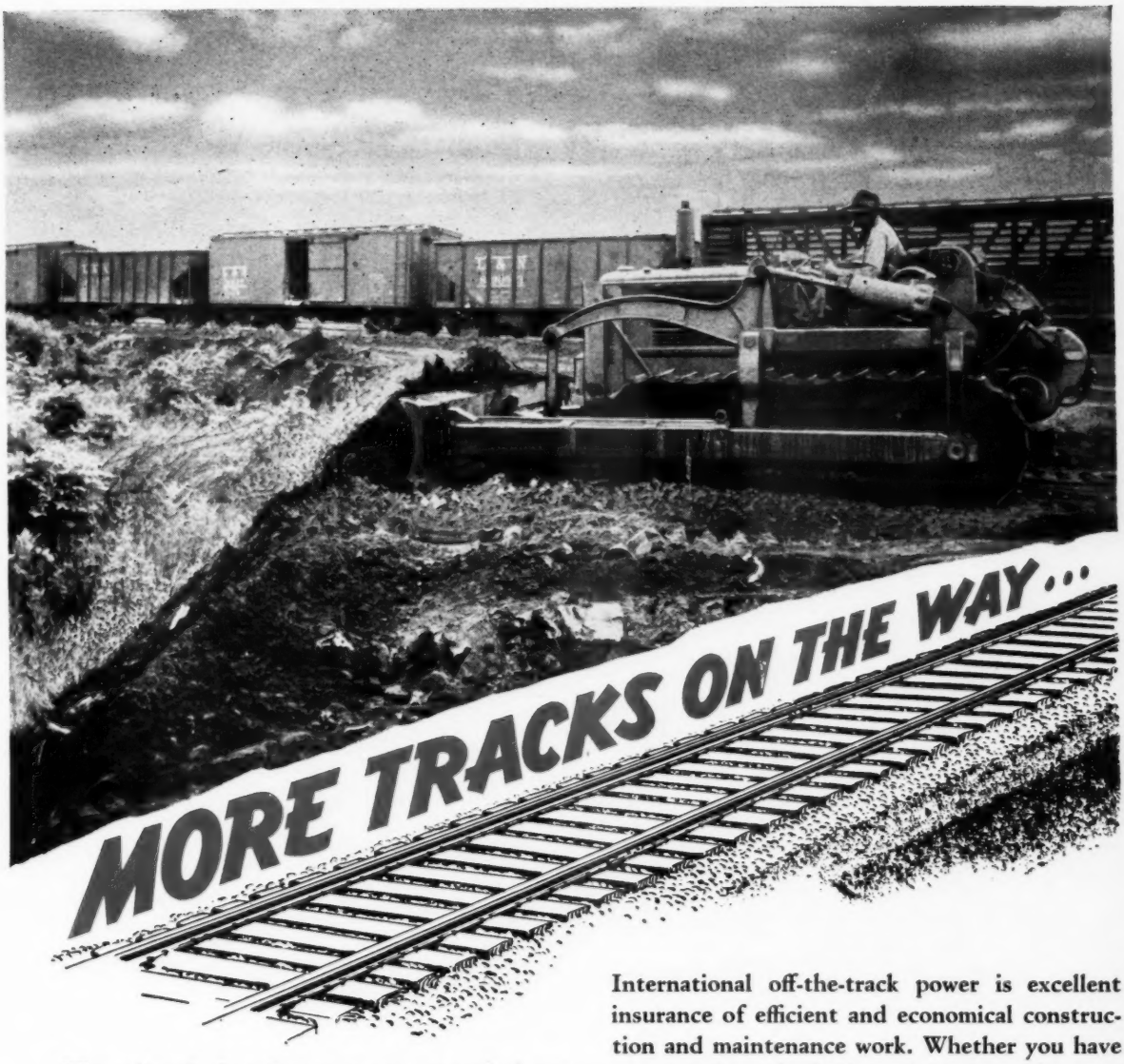
• • •

PITTSBURGH PLATE GLASS COMPANY
Industrial Paint Division, Pittsburgh, Pa.
Factories: Milwaukee, Wis.; Newark, N. J.; Springdale, Pa.; Houston, Texas; Los Angeles, Calif.; Portland, Ore. Ditzler Color Division, Detroit, Mich. The Thresher Paint & Varnish Co., Dayton, Ohio. Forbes Finishes Division, Cleveland, Ohio. M. B. Suydam Division, Pittsburgh, Pa.

PITTSBURGH PAINTS

PAINTS • GLASS • CHEMICALS • BRUSHES • PLASTICS

PITTSBURGH PLATE GLASS COMPANY



There just isn't a faster, more economical way to bulldoze fill than with an International Crawler and matched 'dozer. That's why the Louisville & Nashville R. R. chose an International TD-14 to build the fill for more tracks at their Strawberry Yard in Louisville. In fact, this tractor is one of several TD-14's used by the L. & N. for work on the right-of-way—ditching, grading and all the dozens of tasks needed to keep roadbeds in top shape.

International off-the-track power is excellent insurance of efficient and economical construction and maintenance work. Whether you have more tracks to be built, maintenance of way to be done or any of the many jobs demanding crawler tractor power, it will pay you to see International and compare. Compare Internationals with any other crawler, feature by feature. It's a sure bet, you'll select Internationals.

Your International Industrial Power Distributor is ready to give you a demonstration at your convenience.

Standardize on Power that Pays

INTERNATIONAL HARVESTER COMPANY • Chicago, Illinois

CRAWLER TRACTORS
WHEEL TRACTORS
DIESEL ENGINES
POWER UNITS

INTERNATIONAL HARVESTER

INTERNATIONAL INDUSTRIAL POWER

For additional information, use postcard, pages 807-808

NOW

A CLEAN, EFFECTIVE WOOD PRESERVATIVE FOR CAR LUMBER!

penta-
chlorophenol

THE CLEAN WOOD PRESERVATIVE

Now that PENTAchlorophenol is available you should protect car lumber as well as ties.

PENTA, already popular with the utilities for the clean, effective protection it gives poles and crossarms, offers a real service to the railroads. Car lumber, decking, wood platforms, poles, all need the dependable protection PENTA gives. PENTA does not leach out even under severest moisture conditions. It protects against termites and decay *through the years.*

When cleanliness and reliability really count, specify "PENTA". For further information write Dow, Dept. PE 4-B

PENTA protects ties!

Protect newly adzed tie surfaces with PENTA. Economical and easy to use, even in coldest weather.

DOW
penta-
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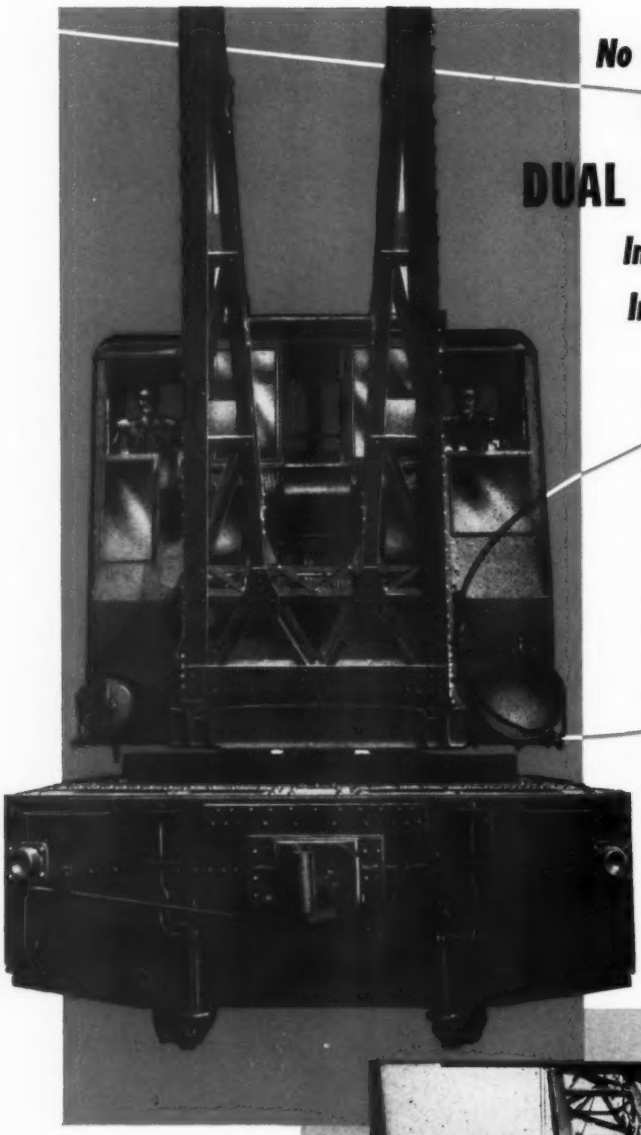
THE DOW CHEMICAL COMPANY
MIDLAND, MICHIGAN



No Need For a Ground Man With

NEW BROWNHOIST DUAL CONTROL DIESEL CRANE

Increases Safety and Efficiency In Maintenance-Of-Way Work

Industrial Brownhoist's Dual Control Locomotive Crane, with a complete set of interlocking controls on each side of its high Monitor-type cab, is ideally suited to maintenance-of-way work because it affords 100% visibility *on either side of the track and to the rear.* The operator of a Dual Control Crane has no blind spots, thus there's no need for a ground signalman. When the operator's work shifts, he has merely to lock the controls where he's sitting, cross to the opposite side and continue his work with the other set of controls. Brownhoist Dual Control Locomotive Cranes are available in all capacities from 20 tons up, with travel speeds ranging up to 13 m.p.h.

Added safety and efficiency is assured because the Dual Control Crane, like all Industrial Brownhoist cranes, is equipped with the new open-type boom that allows the operator full visibility even when the boom is in line with his work. 14" safety clearance is provided between revolving upperworks and carbody.

OPERATOR'S VIEW OF LEFT SIDE OF TRACK

OPERATOR'S VIEW OF RIGHT SIDE OF TRACK

BROWNHOIST BUILDS BETTER CRANES

141

INDUSTRIAL BROWNHOIST CORPORATION • BAY CITY, MICHIGAN

DISTRICT OFFICES: New York, Philadelphia, Pittsburgh, Cleveland, Chicago, San Francisco, Canadian Brownhoist Ltd., Montreal, Quebec.
AGENCIES: Detroit, Birmingham, Houston, Los Angeles, Portland, Seattle, Spokane.

For additional information, use postcard, pages 807-808

Here Are Important Advances in Track Lining and Spike Pulling

READE TRACK LINER

Tests show that this thoroughly modern track liner saves up to 50% in time and labor over other methods. With the READE TRACK LINER, two men to a half rail length do a better, safer job than six men working to a quarter rail length with old-fashioned methods.

This timely device is particularly useful for present day heavy rail. No digging of tie ends is necessary. Track shifts without humping or raising out of cross level.

Track lining is no longer a heavy man-power operation. The tool itself exerts the power—only incidental labor is needed. A demonstration on your own track will show its ease of operation, safety and speed.

READE SAFETY CLAW BAR

How much are BENT spikes costing you? The READE SAFETY CLAW BAR not only provides three-fold safety protection but by pulling spikes straight, avoids costly restraightening.

The SAFETY CLAW BAR eliminates extreme bending over, thus avoiding back injuries to workers. The hooded shield over the claw protects against flying spike heads, rust and scale. The safety marker on the handle prevents hand injuries. Find out what this new track tool can do for you. *Let us demonstrate for you right on your own line.*

READE MANUFACTURING CO., Inc.

135 Hoboken Avenue
Jersey City 2, N. J.

9500 Cottage Grove Avenue
Chicago 28, Illinois

READE EST. 1883

MULTI-PURPOSE

NEW TYPE COATING

1. Prolongs rail life

2. Cuts railway maintenance costs

Rust-Chek

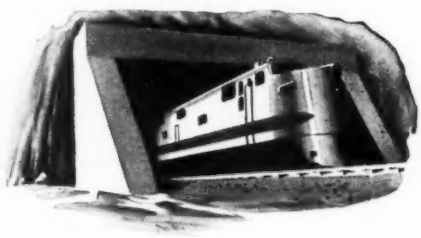
CORROSION-RESISTANT COATING

...resists water, salt and acid fumes

RUST-CHEK was originally developed by the Rinshed-Mason Company to prevent the notoriously excessive corrosion of railway track in tunnels. Applied to the web and base of rails, Rust-Chek prolongs rail life where the going is rough; is unaffected by the impact of train wheels and the consequent flexing of the rails.

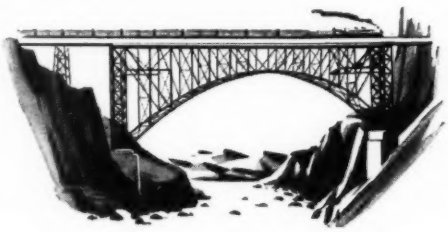
Today, Rust-Chek is finding ever widening acceptance for numerous other railway applications, but especially where corrosion conditions are severe, for Rust-Chek possesses exceptional resistance to water, salt and acid fumes; retains, with long years of service, unusual qualities of flexibility and adhesion that definitely prevent cracking, chipping or peeling.

Investigate now! Skilled R-M engineers to assist you.



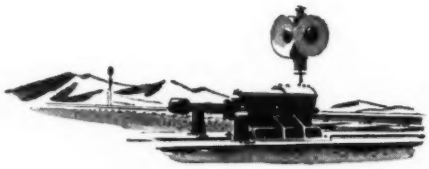
PREVENTS EXCESSIVE RAIL CORROSION

Salt, water and acid fumes often cause frequent and costly rail replacement. Rust-Chek prevents excessive corrosion, but especially in certain tunnels; on rails subjected to brine drippings from heavy refrigerator car traffic; on rails running close to salt water, at grade crossings, etc.



PROTECTS BRIDGES AND STRUCTURAL STEEL

Bridges, round-house structural steel, etc., can be quickly and easily coated with Rust-Chek, adding countless years of life and greatly lengthening time between coats. Rust-Chek puts up a solid front against salt spray, locomotive fumes and moisture.



PROLONGS LIFE OF COSTLY EQUIPMENT

Signalling equipment, water towers, steel boats, barges, buoys, docks, and numerous other types of railway-owned equipment, need Rust-Chek protection for greatly prolonged service life. Unusually tough and highly water resistant, Rust-Chek is easy to apply, calls for no special equipment and may be either brushed or sprayed.

Write for DESCRIPTIVE FOLDER

Free Descriptive Folder and specifications will be sent you on request. Test sample will also be forwarded if wanted. *Write now.*

RINSHED-MASON CO.

5935-71 MILFORD AVE. . . . DETROIT 10, MICH.

the improved GAUTIER rail anchor

Tested, and proven first by railroad track and maintenance men on four important counts. Improved in design to distribute load and stress over 4-point contact.

4-count Operating Efficiency!

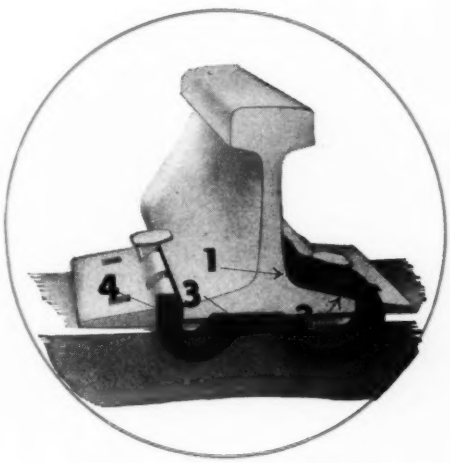
SAVES LABOR—A one-piece anchor that can be applied quickly with a maul or spike maul.

CAN'T BE OVERDRIVEN—So constructed that the loop end bears against the fillet which joins the web to the base of the rail . . . prevents overdriving.

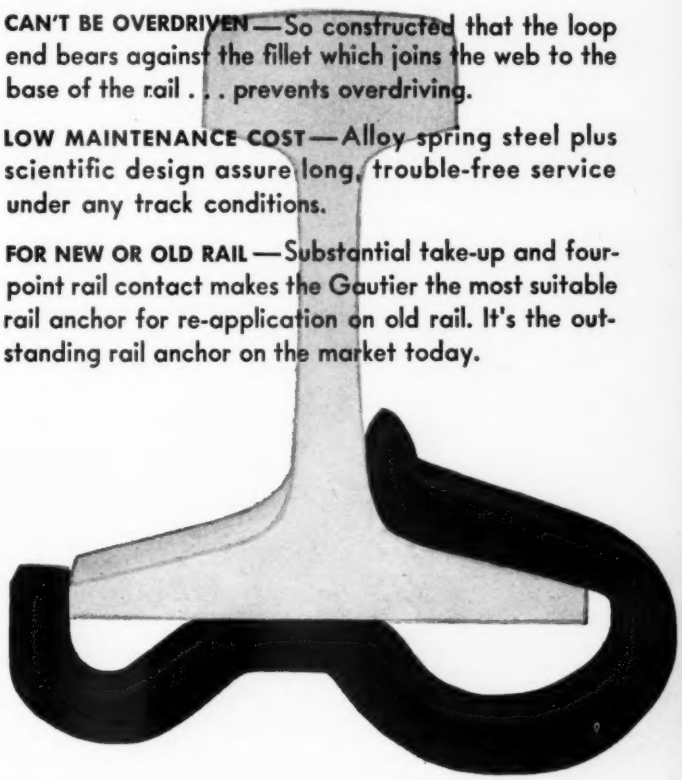
LOW MAINTENANCE COST—Alloy spring steel plus scientific design assure long, trouble-free service under any track conditions.

FOR NEW OR OLD RAIL—Substantial take-up and four-point rail contact makes the Gautier the most suitable rail anchor for re-application on old rail. It's the outstanding rail anchor on the market today.

4-point Distribution of Loading



The Improved Gautier provides plenty of bearing area against the rail and tie (see cut) so that the load is distributed widely and evenly. Points of concentrated loading are eliminated.



Visit our booth 181 at the Coliseum, Chicago, Sept. 18, 19, 20

Mid-West Forging & Manufacturing Company

General Offices: 38 S. Dearborn St., **Chicago 3, Ill.** Manufacturing Plant: **Chicago Heights, Ill.**

Jacks are "ACES" with maintenance men ...WHEN THEY'RE ALCOA ALUMINUM!

"On account of their light weight, we are now ordering aluminum jacks for track raising jobs. Any reduction in weight is quite important because of the amount of necessary carrying."

J. R. Scofield
Assistant District Engineer
New York Central
Detroit, Michigan

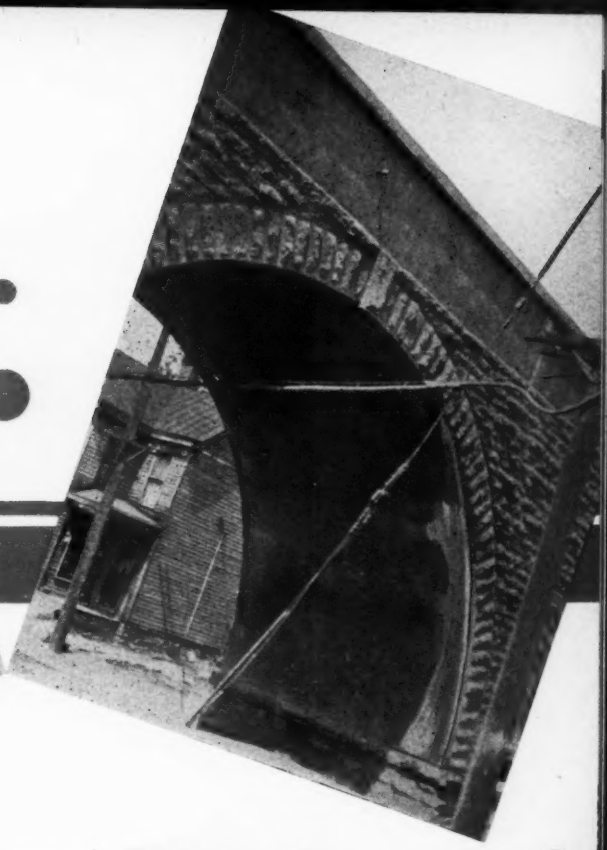
Switching to aluminum track jacks makes sense to experienced maintenance men. One third less weight means easier carrying, easier spotting, less time to get the job done. Thick, massive Alcoa Aluminum Alloy Castings make jacks strong and safe. Good for many years of hard service, too—because aluminum *lasts*, resists corrosion.

Let *aluminum* lighten the job! Before you buy, ask your supplier about maintenance tools and equipment made of Alcoa Aluminum. You'll speed the work, save effort, cut costs. ALUMINUM COMPANY OF AMERICA, 1820J Gulf Building, Pittsburgh 19, Pennsylvania. Sales offices in principal cities.

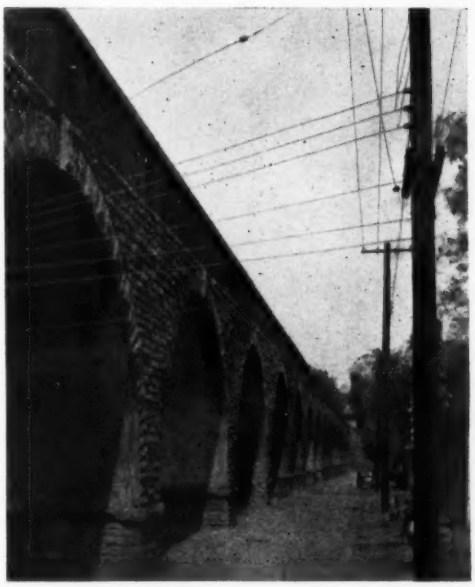
ALCOA FIRST IN ALUMINUM ...THE METAL THAT *LASTS*

ALCOA ALUMINUM

INGOT - SHEET & PLATE - SHAPES, ROLLED & EXTRUDED - WIRE - ROD - BAR - TUBING - PIPE - SAND, DIE & PERMANENT-MOLD CASTINGS -FORGINGS - IMPACT EXTRUSIONS
ELECTRICAL CONDUCTORS - SCREW MACHINE PRODUCTS - FABRICATED PRODUCTS - FASTENERS - FOIL - ALUMINUM PIGMENTS - MAGNESIUM PRODUCTS



EMBECO Repairs Gave 700 Foot Bridg "New Lease On Life



Non-Shrink Embeco used throughout in repairs on this 700 foot railroad bridge in Hamilton, Ohio. Disintegrated concrete in parapets cut out and replaced with gunite; sides and top of arches pressure grouted; arches lined with 2" gunite; balance of stone work tuckpointed. After two years heavy vibration from down-grade braking of trains, repairs are in excellent condition. One of many Embeco repair jobs done by George E. Detzel Co., Cincinnati, Ohio, Restoration Contractors.

Railway properties, such as this 17 arch bridge, being brought up to the requirements for safe, adequ and modernized transportation by the Emb Non-Shrink Method.

Counteracting all shrinkage in mortar and gr Embeco is used widely and successfully for grou bridge, turntable and heavy machinery bed plates pointing old stone structures, reintegration of crete masonry piers and abutments and the applica of gunned concrete for tunnel lining, repai retaining walls, dams, abutments and piers.

Fill in and mail coupon below for full information the Embeco Non-Shrink Method.

THE MASTER BUILDERS CO.
7016 Euclid Ave., Cleveland 3, Ohio

Please send me full information on the Embeco Non-Shrink Method for co reintegration and grouting.

Name.....

Company.....

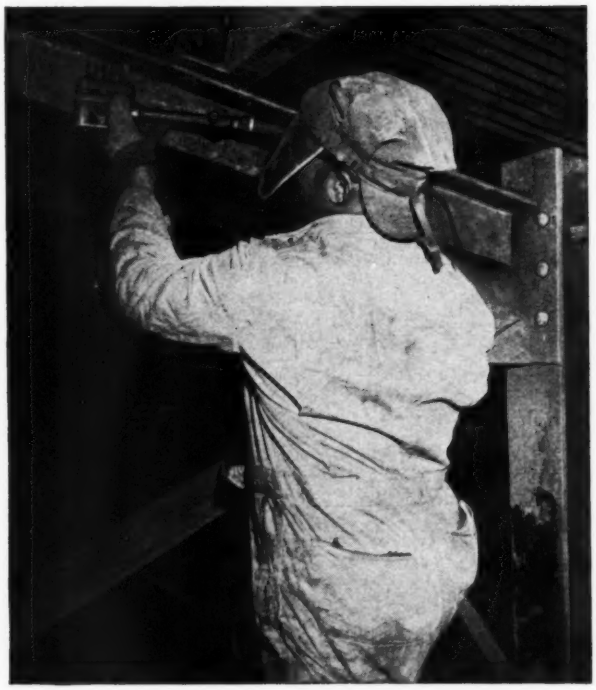
Address.....

the MASTER BUILDERS

CLEVELAND 3, OHIO TORONTO, ONTARIO

Cost-Cutting Tools FOR BRIDGE BUILDING

Tough scaling jobs are handled quickly with the air-powered CP Triple Scaler — weighing only 7¼ pounds. No chisels are required, as the pistons act as chisels, hammering old paint, rust or scale without damaging the underlying surface.



Designed for drilling holes in masonry, concrete and stone up to 1¼ inches in diameter, the 7½-pound, air-powered CP-9 self-rotating Handril does the same work as non-rotating hammer drills of triple its weight. Readily operated with one hand, even for up-drilling. A specially designed chuck makes it easy to change steel. The same chuck handles non-rotating chisels.

Loose scale is rapidly removed from any metal surface with air-powered CP Wire Brush Machines. Models, with either straight or pistol grip handles, are available with a wide choice of radial and cup wire brushes.

AND MAINTENANCE-OF-WAY

Visit Booths 57 & 58

at joint exhibition of

The Track Supply Association

The Bridge and Building Supply Men's Association

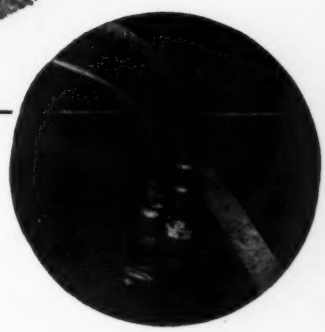
The Coliseum, Chicago

September 18-20

The CP-220 Hicycle Electric Concrete Vibrator can be operated anywhere in a 400-foot radius, without stopping to move the portable gasoline generator. Built for one-man operation. The vibrator motor is in the head of the tool; there is no flexible shafting.

Designed for concretes of 2" slump and over; walls, footings, columns, floor and roof slabs; precast piles and similar products. Capacity of 30 to 40 cubic yards an hour.

The powerful CP-365 Air Impact Wrench, with controllable rotary impact action, is unexcelled for fast, safe nut-running, and the application or removal of bolts, studs or lag screws. Absence of twisting or kickback, and little vibration, minimizes operator fatigue. Eight-inch extension shanks are available for screw spike driving.



The CP-20 Sump Pump operating at 40 pounds pressure against a 15-foot head, has a capacity of 200 gallons per minute. Operating at 80 pounds pressure against a 50-foot head, its capacity is 225 gallons per minute.

A single-stage centrifugal pump that requires no priming, it starts pumping instantly when air is turned on and the unit lowered into water.

Perfectly balanced, requiring no riding, easy to hold, the CP-117 and CP-118 Cut Spike Drivers will drive any cut spike in a few seconds.

CHICAGO PNEUMATIC TOOL COMPANY

General Offices: 8 East 44th Street, New York 17, N. Y.

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES
ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

When roadbeds go to pieces time and again, it's usually a sign of buried rain in the subgrade, even though the surface may be dry. The only sure cure for continuing maintenance trouble is to drain out the excess water and keep it out. You can do this easily and economically with Armco Perforated Pipe.

Through scientifically placed holes, Armco Pipe absorbs unwanted water and drains it away. Subgrades become dry to provide a firm foundation. Frequent maintenance disappears.

Armco Pipe is ideal for complete drainage systems or for correcting trouble spots. It is easy and economical to install. Unskilled workmen quickly join long lengths of Armco Pipe into a uniformly strong conduit by using simple band couplers. There are fewer sections to lay, fewer joints to assemble.

You are assured long, efficient service from Armco Pipe. Though light in weight for easy handling, it has strength to withstand crushing, cracking or disjointing under the impact and vibration of heavy loads. It is not affected by shifting soils or severe frost action.

Let Armco Perforated Pipe help you correct unstable track conditions. You'll like the economy and freedom from maintenance. Write for complete information. Armco Drainage & Metal Products, Inc., 3540 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation.

Export: The Armco International Corporation

ARMCO PERFORATED PIPE

ARMCO

ADDITIONAL INFORMATION

On Any of the Products Mentioned in This Issue

Below is a complete index of the products referred to in both the editorial and advertising pages of this issue. If you desire additional information on any of them, use one of the accompanying addressed and stamped postcards in requesting it. In each case give name of product and page number. The information will come to you directly from the manufacturer involved, without any obligation on your part.

Products Index

RAILWAY ENGINEERING AND MAINTENANCE

September, 1950

Please send me additional products information as requested below.

☐ Literature Only ☐ Desire to see Representative ☐ Price Data

Product and Page No. .....

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Title or Position .....

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RAILWAY ENGINEERING & MAINTENANCE

30 Church Street

New York 7, New York

and **WON'T** *if it's* **VAPOR-DRIED***

Checks and splits mark the doom of many a tie which might otherwise be good for years to come. They let in moisture and decay, as well as ballast particles which under the influence of shrinking and swelling, finally cause the tie to split apart. The result—replacement before the tie's normal life is realized.

Because Vapor-Dried* ties decrease checking and splitting, they last longer. And they save you money in other ways, too. Since they need no long air-seasoning period, inventories are reduced. You pay less for space, insurance, and interest on investment. "From trees to track in hours instead of months" is literally true with Vapor-Drying*. Another advantage: Vapor-Drying* lets preservatives penetrate deeper; makes it possible to use woods which normally are susceptible to early decay. And remember: Vapor-Drying* is good for all timbers and general purpose lumber as well as ties.

If you are responsible for maintaining track, you will want to know the whole story of Vapor-Drying*. So write today and ask us to tell you about it.

*Process Pat'd.

VISIT US AT BOOTH 157 AT CHICAGO

TAYLOR-COLQUITT CO.

SPARTANBURG, SOUTH CAROLINA

Look at the

OF THE PULLMAN-

Circled in this crib's-eye view are the "picks" and (behind them) the "digger bars" that bite into the hardest cemented rock ballast, crack it like peanut brittle, and sweep it out with whisk-broom ease.

They are made of heat-treated chrome-nickel steel. A 6200-pound drophead pile-drives them into the ballast with a force of 173,600 inch pounds, thirty times a minute. And cribs come clean in *seconds!*

That's putting *power* to work the modern way ... for fully mechanized track maintenance that saves manpower, time, and money. *Important* money, as case history after case history proves.

The Pullman-Standard Power Track Cribber *pays for itself* out of savings. So do the Pullman-Standard Ballast Cleaner and Power Track Ballaster. The three machines can be operated *as a production-line team,* to give track the "full treatment" if desired.

Investigate these sturdy, capable machines...and the *three ways* in which they may be acquired, for immediate money-saving action. Full information will be promptly supplied.

AGAIN . . . LOOK AT THE "BUSINESS END"

This one case history, *out of many,* shows how the Pullman-Standard Power Track Cribber is saving important money for important railroads. In this instance, it cribbed out 8014 cribs in very hard cemented rock ballast at an average speed of *45 seconds* per crib. Hand-work required approximately one man-hour per crib. Comparative costs *per crib* were:

Hand-Cribbing	$1.00*
Machine-Cribbing	0.20
Saving per Crib	0.80
Saving for 8014 Cribs	$6,411.20

**Cost calculated before latest wage increases and 40-hour week.*

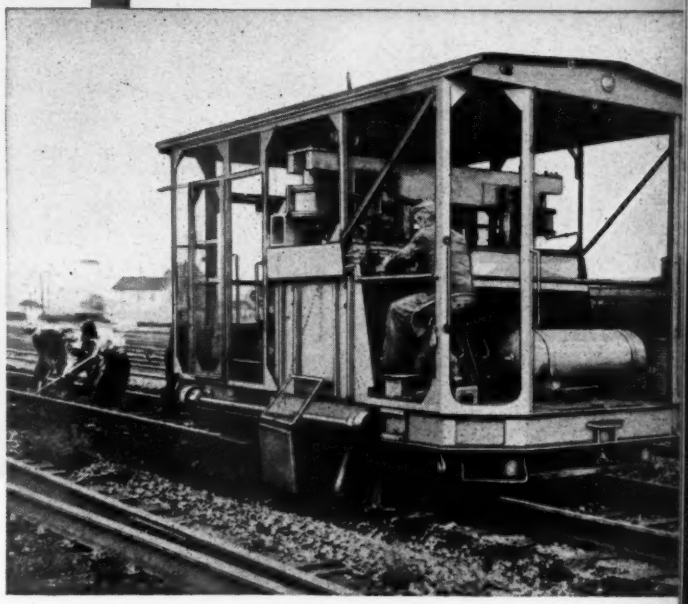
"TRACK AT ITS LEVEL BEST" describes, illustrates, and diagrams all three Pullman-Standard track maintenance machines. 24-pages, data-file size. Write for your copy.

THREE WAYS TO BUY

Pullman-Standard power track maintenance machines are available to railroads in any of these ways:

1. **By outright purchase.**
2. **By deferred payment.**
3. **By rental, with option to purchase.**

The Pullman-Standard Power Track Cribber can crib out from 170 to 250 feet of track per hour. Interchangeable 4-, 5-, and 6-inch digger-bar tips are available for working varying ballast conditions with greatest efficiency. The cribber travels to and from location under its own power, at a speed of 25 miles per hour. Power-operated jacks and transverse wheels permit complete setoff in from 3 to 5 minutes.



e "Business End"

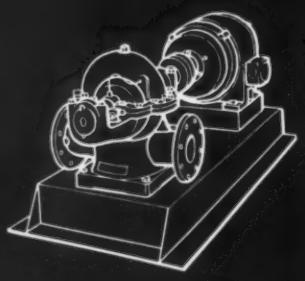
STANDARD POWER TRACK CRIBBE

At the Chicago Coliseum, Sept. 18, 19, 20
See the Pullman-Standard exhibit of the most modern developments in mechanized track maintenance.

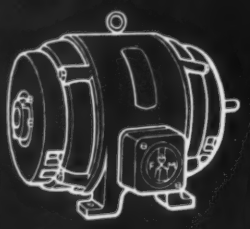
Pullman-Standard
CAR MANUFACTURING COMPANY
POWER BALLASTER DIVISION
79 East Adams Street, Chicago 3, Illinois

BIRMINGHAM 3, 1004 First National Building
CLEVELAND 15, 907 Midland Building
NEW YORK 17, 52 Vanderbilt Avenue
PITTSBURGH 19, 1115 Gulf Building
WASHINGTON 6, D. C., 1025 Connecticut Ave., N.W.
SAN FRANCISCO 4, 2910 Russ Building

CANADA: The Holden Co., Ltd.
Montreal 3, 614 St. James St. W.;
Toronto, 128 Simcoe St.; Winnipeg, 150 Princess St.;
Vancouver, 769 Powell St.

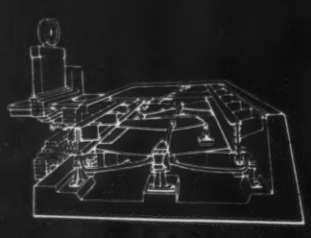


Centrifugal Pumps

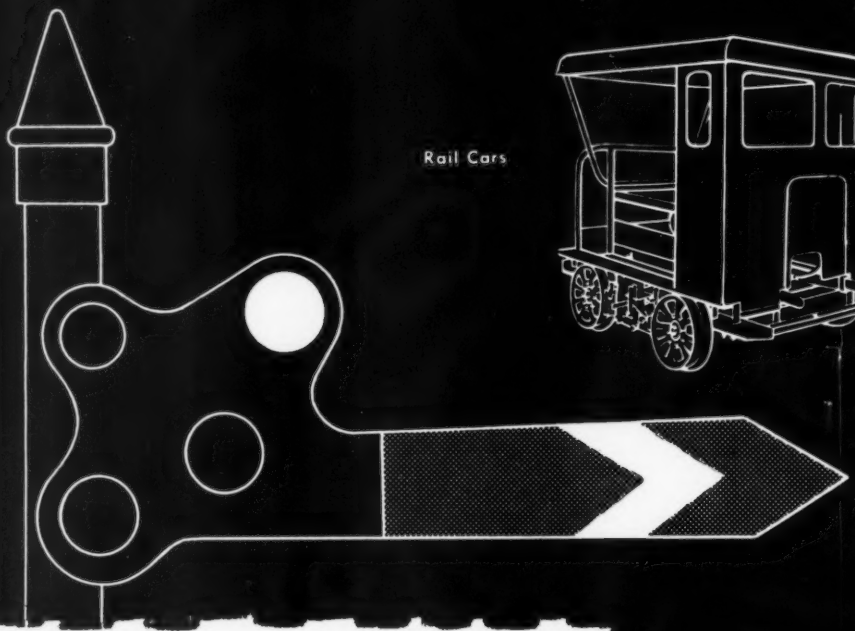


Electric Motors
and Generators

Turbine Pumps



Truck Scales



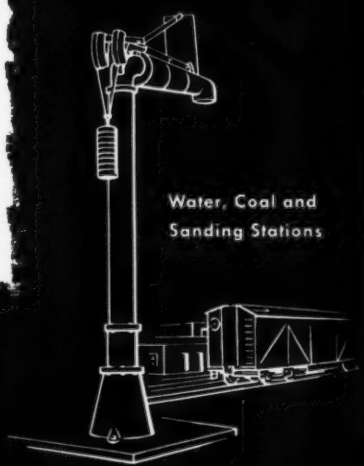
Rail Cars

FOR RAILROAD EQUIPMENT
IT'S

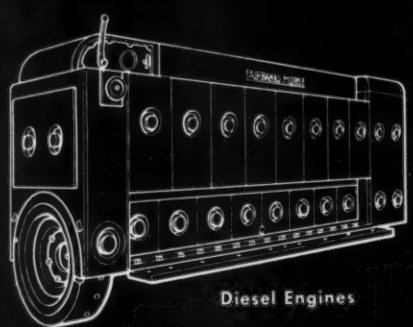
FAIRBANKS-MORSE,

a name worth remembering

DIESEL LOCOMOTIVES AND ENGINES • ELECTRICAL MACHINERY • PUMPS • SCALES
HOME WATER SERVICE AND HEATING EQUIPMENT • RAIL CARS • FARM MACHINERY



Water, Coal and
Sanding Stations

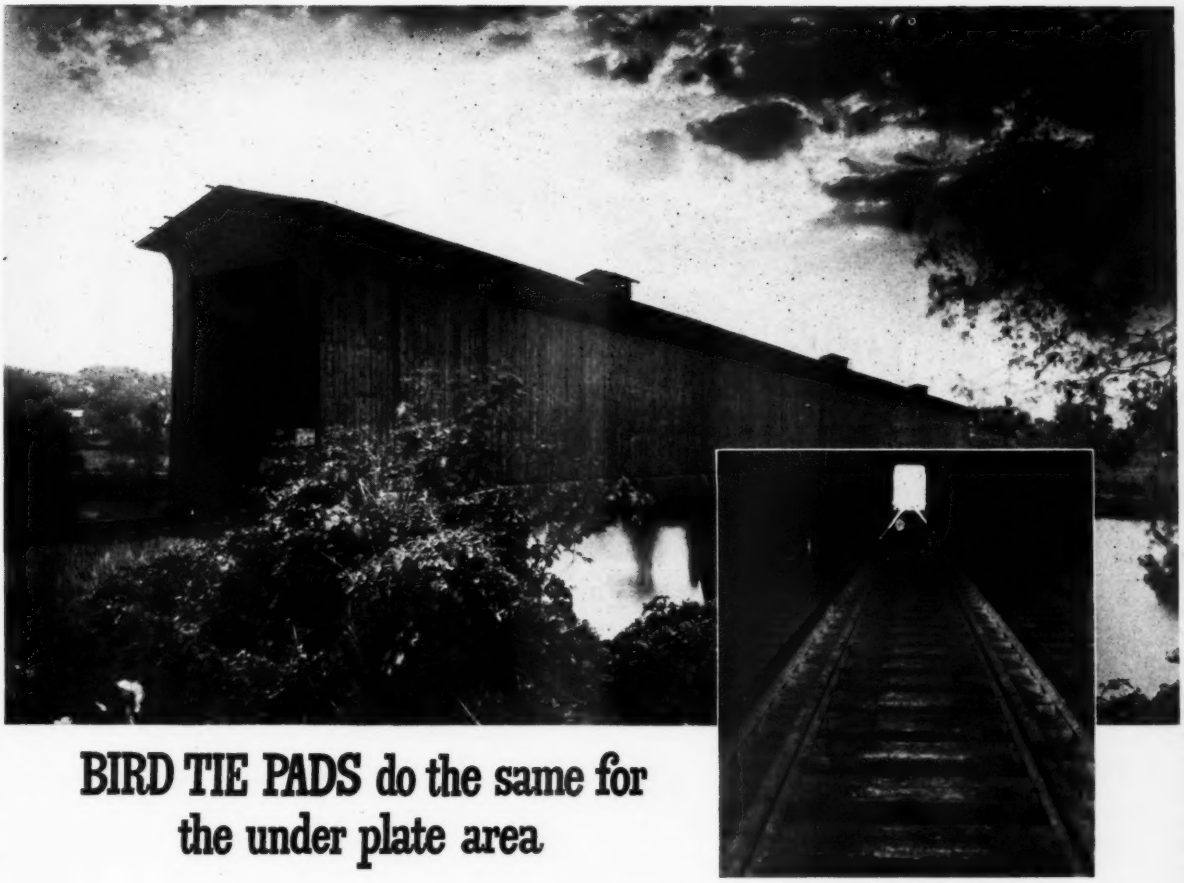


Diesel Engines

Track Scales

51 YEAR OLD BRIDGE TIES

Still good because they are DRY on this COVERED Railroad Bridge



BIRD TIE PADS do the same for the under plate area

Come in to see actual ties from this bridge at our booth (No. 42-42N) at the Bridge and Roadmasters Show at the Coliseum in Chicago, September 18-20. Also ties of similar age and condition from other protected locations and ties with equal protection from Bird Tie Pads.

BIRD TIE PADS

East Walpole, BIRD & SON inc Established 1795 *Massachusetts*

DON'T MISS THE 1950 NORDBERG EXHIBIT at the SEPTEMBER SHOW ...bigger and better than ever before!

These views will remind you of the Nordberg products displayed at last year's show . . . which was one of the largest exhibits in Chicago's Coliseum. Now, for 1950, we are planning an even larger, more complete exhibit of the latest developments in Nordberg Maintenance-of-Way equipment. *We'll be looking for you in BOOTHS 7-S to 20-S inclusive at the south end of the Coliseum.*

R650

Look to **NORDBERG**

. . . for continually improved TRACK MAINTENANCE MACHINERY
to do a Better, Faster Maintenance Job at Lower Cost

NORDBERG MFG. CO., Milwaukee 7, Wisconsin

TIME-SAVERS *For* TIME-TABLES

MOTO-CRANES . . . roll on rubber at speeds up to 30 m.p.h. —on the highway or cross country.

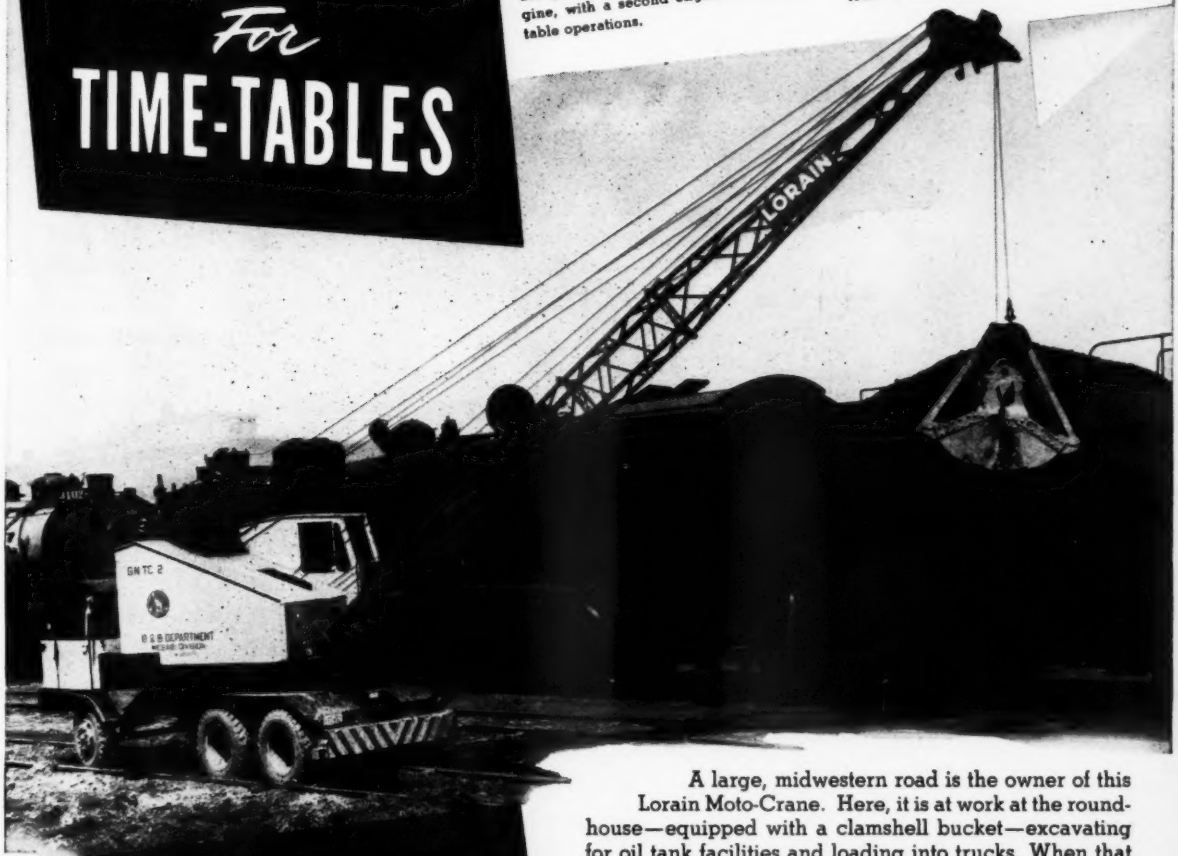
MOTO-CRANES . . . can save time at the yards—or speed to distant jobs along the right-of-way.

MOTO-CRANES . . . are propelled by a separate carrier engine, with a second engine for all turntable operations.

MOTO-CRANES . . . are available in 2 and 3 axle models with 4 or 6 wheel drives.

MOTO-CRANES . . . can be equipped with 5 interchangeable front ends—to dig, lift, load—handle any material.

MOTO-CRANES . . . are available in capacities from 10 to 45 tons—designed for rubber-tire duty.



LORAIN MOTO-CRANES Get *MORE* Jobs Done . . .

IN THE YARD . . . ON THE RIGHT-OF-WAY!

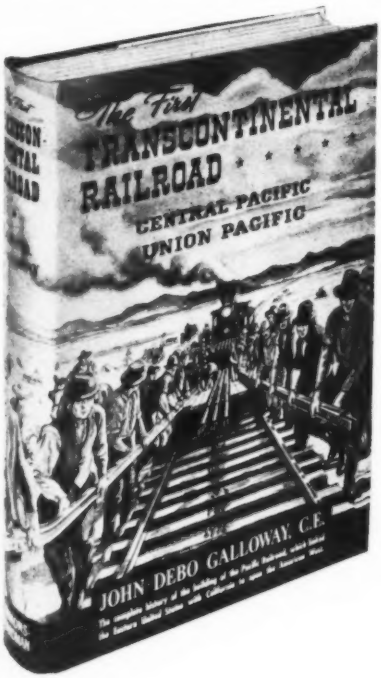
A large, midwestern road is the owner of this Lorain Moto-Crane. Here, it is at work at the roundhouse—equipped with a clamshell bucket—excavating for oil tank facilities and loading into trucks. When that job is done, the Moto-Crane will be off on another—and then another assignment as shovel, dragline, clamshell or crane. And that is the secret of Lorain Motor-Crane popularity. *They get more jobs done!* Mobility is unrestricted. They have the speed, power, mobility and work capacity to go anywhere on a moments call—to lift, or dig, or load—to handle the bulkiest materials from sand to steel. Modern railroading can find a hundred-and-one jobs for a Moto-Crane . . . and save time and money on every job. Ask your Thew-Lorain Distributor for full facts about these "time-savers" that will make your time-tables click!

THE THEW SHOVEL CO., LORAIN, OHIO

THEW LORAIN®

SHOVELS • CRANES • HOES
DRAGLINES • CLAMSHELLS
ON CRAWLERS OR RUBBER TIRES

The First TRANSCONTINENTAL RAILROAD



By JOHN D. GALLOWAY, C.E.

The construction of the Union Pacific and Central Pacific railroads linking Omaha with Sacramento was the crowning achievement of the railroad era. It was considered by the author the greatest engineering project of the Nineteenth Century.

The author for more than forty years was a leading consulting engineer of San Francisco. He was thoroughly familiar with the original routes of both railroads. While gathering manuscript material he carried on an extensive correspondence with relatives of the builders. Many of the authentic photographs showing construction methods were from his private collection.

The individual contributions of railroad engineers, construction company heads and railroad officials who had a part in this great project are objectively appraised. Biographical sketches of the more prominent engineers and railroad builders of the era are included.

Contents

The Pacific Railroad—The Origin and Development of Railroads Prior to 1870—Early Projects and the Pacific Railroad Surveys—The Builders of the Central Pacific Railroad—The Central Pacific Railroad Company—Locating the Central Pacific Railroad—Constructing the Central Pacific Railroad—The Builders of the Union Pacific Railroad—The Union Pacific Railroad Company—Locating the Union Pacific Railroad—Constructing the Union Pacific Railroad.

320 pages, 73 photographs, 4 maps, bibliography, index

$5.00

Reviews

"The story of these railroads had been told many times. However, few authors approached the Herculean project with the same appreciation of the problems involved as has Galloway. You are left with the firm belief that building this first transcontinental railroad was truly the greatest engineering feat of the 19th Century." **Engineering News-Record.**

"At Promontory, Utah, there stands a great stone monument to the **Last Spike** which joined the two branches of this nation's first cross-continental railroad. The story of the Central Pacific's long trek over the Sierras from Sacramento eastward and of the corresponding labors of the Union Pacific's workers who worked west from Omaha is one of the greatest chapters of nineteenth-century progress. This story, this epic of Americana, is told from the viewpoint of a civil engineer. **—The Argonaut.**

"Galloway rates as one of the great engineers who had an important part in the development of Western America. As an authoritative record of one of the nation's greatest engineering achievements, his book is a basic contribution to the literature of American railroading."—**Southern Pacific Bulletin.**

TEN DAYS FREE EXAMINATION

Simmons-Boardman Publishing Corporation
30 Church Street, New York 7, N. Y.

Please send me on Ten Days' Approval a copy of Galloway's FIRST TRANSCONTINENTAL RAILROAD, $5.00. If satisfactory I will remit the list price; otherwise I will mail back the book.

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Company _____ Position _____

R. E. & M. 9-50

these WOOLERY machines *speed* maintenance work and *cut* costs

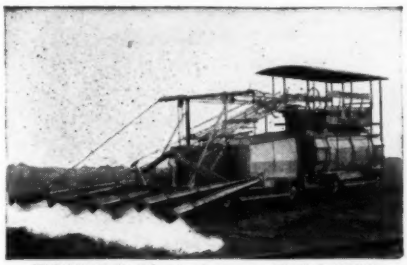
On thousands of miles of busy roadbeds WOOLERY machines are in use on routine maintenance work at all seasons of the year. For weed eradication, snow clearance, tie cutting, or tie plate spacing, WOOLERY Maintenance Equipment takes over the labor of the job with mechanized efficiency, producing uniform results with reliable speed and economy.

1. WOOLERY Tie Cutter

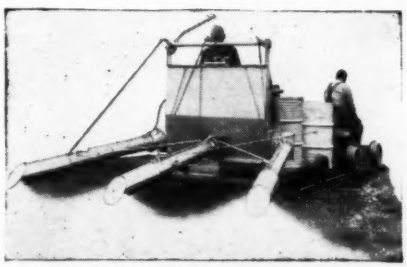
The WOOLERY Tie Cutter and Undercarriage enables one man to quickly cut each worn tie into three easily-removable pieces which can be lifted out without disturbing the ballast, so that new ties can be reseated on a firm bed. With this modern machine the entire cutting operation is performed without lifting or turning, by traveling the cutting mechanism across the undercarriage to cut both ends of the same tie, and rolling the whole apparatus along the rails to successive tie positions. Total cutting time per tie is less than two minutes.

2. WOOLERY Weed Burners

WOOLERY Giant Octopus Model WBZ Weed Burner will destroy a swath of weeds 25 feet wide in one trip or up to 35 feet with burner arms extended on second run. Other WOOLERY Weed Burners are made in 1-burner and 3-burner models. Weed burners can be operated in winter as snow melters.



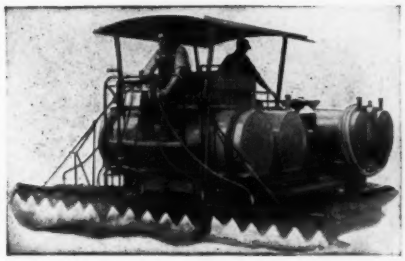
WOOLERY Giant Octopus Model WBZ Weed Burner



WOOLERY MODEL PBB Weed Burner

3. WOOLERY Chemical Sprayer

A dual - purpose machine which may be used as a chemical sprayer or weed burner; especially useful for killing weeds near buildings or in areas where open flames would be too hazardous. Chemical sprayer is 18 feet wide. Burner unit covers 15-foot swath first trip, up to 25-foot swath second trip.



4. WOOLERY Tie Plate Spacer

WOOLERY Tie Plate Spacer quickly and accurately locates single or double shoulder plates at exact position on ties. Light in weight so that one man can easily handle it on or off track.

5. WOOLERY Motor Car

WOOLERY No. 300 Motor Car gives advantages of a light car with heavy-duty performance and greater pulling power. Four-wheel drive, with differential when needed; two speeds forward, two reverse. Light enough for one man to lift on or off at crossings; large enough to carry eight men and track tools.

Visit the Display of WOOLERY Machines at Booths 22-25, Chicago Coliseum, September 18, 19, 20

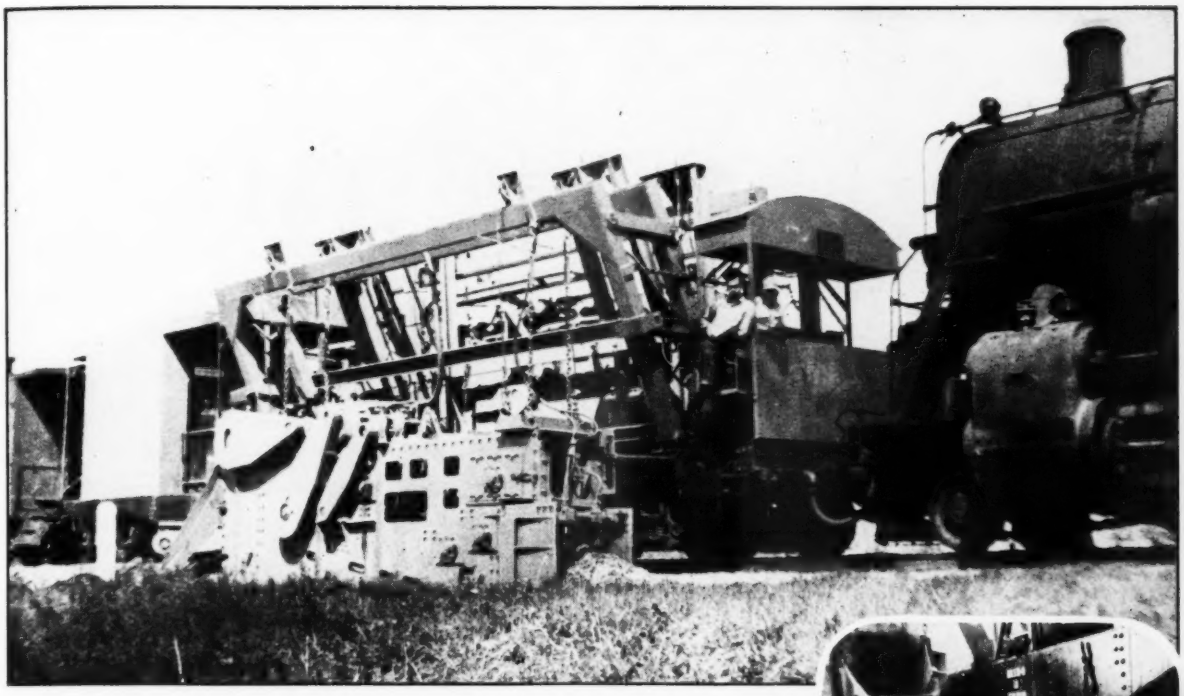
WOOLERY MACHINE COMPANY

MINNEAPOLIS MINNESOTA

Pioneer Manufacturers of RAILWAY MAINTENANCE EQUIPMENT

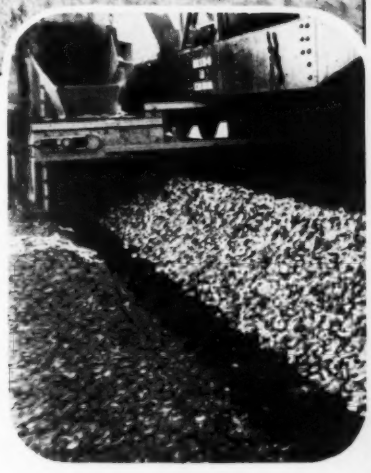
RAILWAY WEED BURNERS • MOTOR CARS • FLANGEWAY CLEANERS • TIE CUTTERS • TIE PLATE SPACERS • RAIL JOINT OILERS • CREOSOTE SPRAYERS

EXCLUSIVE EXPORT REPRESENTATIVES: PRESSED STEEL CAR COMPANY, INC., NEW YORK, N. Y.



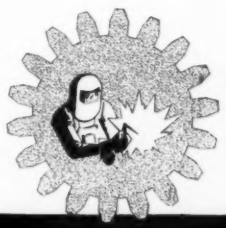
ONE MILE PER HOUR BALLAST CLEANING

with the *Ballastmaster*



Above is rear view of cleaning box showing how cleaned ballast is deposited close to tie ends, then shaped to any desired contour.

The normal operating speed of the Ballastmaster is at the rate of one mile per hour of track time under average conditions of ballast.



MANUFACTURED AND SOLD BY

★ The Ballastmaster may be inspected and seen in operation on September 19 and 20 near Chicago. Be sure to register at booth 169 at the Track Supply Exhibit (Chicago, Sept. 18, 19, 20) for an inspection trip.

THE CHATTANOOGA WELDING AND MACHINE COMPANY

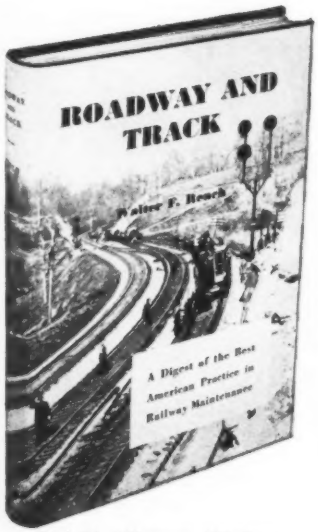
CHATTANOOGA, TENNESSEE

"Machine Builders Since 1909"

A Handbook of
Modern Track Work

ROADWAY AND TRACK

By Walter F. Rench
Formerly Supervisor on the Pennsylvania Railroad;
Author of Simplified Curve and Switch Work



Third Ed. 350 pages, 101 photographs 19 line drawings, 12 tables, index, 6 x 9, cloth, $5.00.

The third edition features the use of the latest mechanical equipment in connection with roadway and track maintenance. Older methods employed where full mechanical equipment is not available are also explained. While most of the methods described are those which are standard on the **Pennsylvania**, A.R.E.A. recommended practices and those in use on other well maintained roads have also been included.

Outstanding types of mechanical equipment used in track work are described and illustrated with action photographs. Engineering drawings show working details. The economies resulting from the adoption of modern methods are clearly outlined. Useful tables have been added to make the book suitable for reference use, as well as a practical handbook on modern methods.

CONTENTS

Part I–ROADWAY: Essential Elements in Roadway Maintenance–The Right of Way–Drainage of Roadbed and Track–Vegetation for Banks–Economics of Roadway Machines–Labor Saving Methods and Devices in Roadway Work–Small Tools and Their Uses.

Part II–TRACK: Essential Elements in Maintenance of Track–Program for Maintenance of Way and Structures Work–The Track Obstruction–Power Machines and Equipment–Labor Saving Methods in Track Work–Track Materials and Their Uses–Practice in Rail Renewals–Practice in Rail Repair and Inspection–Maintenance of Main Tracks–Maintenance of Yards and Terminals.

Part III–SPECIAL PROBLEMS AND DUTIES: Maintenance Problems and Methods Used–Economics of Track Labor–Special Duties in the Maintenance of Way Department.

SUPPLEMENT: A 10-page Supplement describing new A.R.E.A. recommendations and changes up to July 1, 1948, can be cut for insertion in proper place.

Send For Your Copy Today

Send for a copy today and see how it will help you improve your knowledge of your work.

TRACK SUPERVISORS

While written primarily to serve the needs of track supervisors and other maintenance officers, it contains material of considerable interest to transportation and mechanical officers who require a working knowledge of the fundamentals of maintenance of way practice. Section and extra-gang foremen, who wish to acquire a broader knowledge of their work will find it particularly helpful.

– Ten Days Free Examination Coupon –

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Please send me on Ten Days Free Examination a copy of the Third Edition of ROADWAY AND TRACK by Walter F. Rench. If satisfactory, I will remit the list price of $5.00. Otherwise, I will mail the book back postpaid, without obligation.

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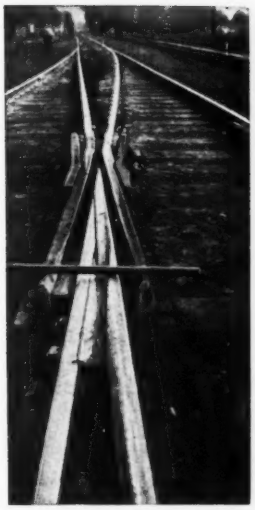
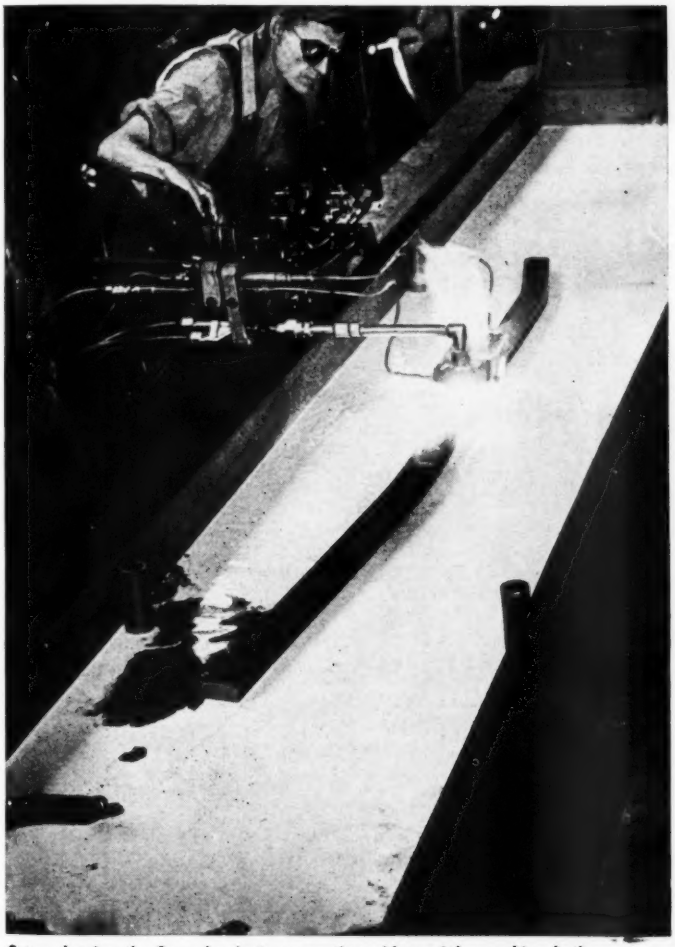
R. E. & M. 9-50

TWO YEARS' SERVICE...

proves flame hardening of frogs cuts frog replacement and maintenance costs of rolling stock



Here you see the wear behind the heat treated area, and get some idea of the traffic over the frog.



Setup showing the flame hardening operation with special quenching bath.

Several years ago, open-hearth carbon steel frog service life in certain locations on one of America's leading railroads averaged six months – replacement costs ran high.

In August 1947, Airco's modern flame hardening method was introduced, and flame hardened frogs were installed on switching leads – points where they would receive the greatest abuse.

A continuing test on these flame hardened frogs was made. It was found that after hardening the frogs about 32 inches on the wing, and 20 inches on the point, the rate of wear on the wing and point was uniform over a two-year period. This meant a drastic reduction in shock to the rolling stock – reduced maintenance costs.

The Airco flame hardening process is simple and economical. It is flexible and selective for application in the shop on small or large objects – flat or circular surfaces. Its outstanding quality is, it provides sufficient surface hardness to retard wear without affecting toughness or shock resistance of the core metal.

For further details about this process, write your nearest Airco office.

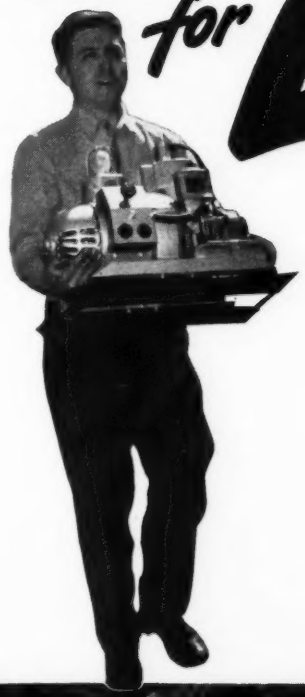
Costs Come Down Under The Airco Plan

AIRCO

AIR REDUCTION

Offices in All Principal Cities

Go High Cycle for Low Costs

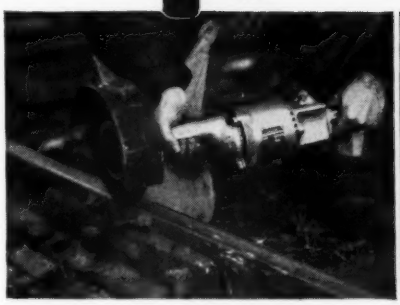


High Cycle Tools Operated by a HOMELITE *Dual Purpose* GENERATOR will greatly reduce your costs

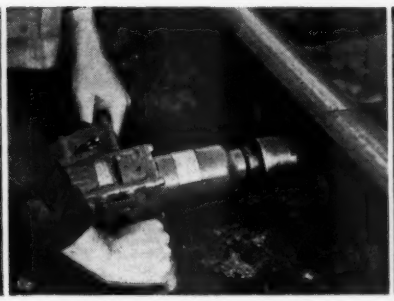
High cycle tools are not only here to stay . . . they're here to *save.* Lighter in weight . . . easier to handle . . . more efficient in operation . . . these modern tools are saving money by cutting down man hours. Yes, and they're saving money on tool repairs because high cycle tools are far easier to keep in good condition.

And the beauty of it all is this: — These savings are yours any place on your road if you have a Homelite Dual Purpose Generator. Light enough for one man to carry, this gasoline-engine-driven generator can be easily put into action *anywhere.* It provides plenty of power for operating high cycle tools. Moreover, this same generator can also be used to operate floodlights or your present standard universal tools.

Look into this Homelite Dual Purpose Generator. It's a big step in the right direction towards lower costs through high cycle operations.



For operating high cycle grinders



For operating high cycle wrenches

For operating Homelite Electric Chain Saws

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1. Performance. A Homelite gives you plenty of power where you want it, when you want it . . . power with a large overload capacity . . . power that isn't sapped by long dangerous cables. It is not affected by extreme temperatures and is dust proof, rainproof, *foolproof.*

2. Dependability. The famous Homelite dependability is the result of building more than 275,000 gasoline-engine-driven units during the past quarter century. Finest, tested materials, precision workmanship, plus sound simplicity in advanced design are part of every Homelite.

3. Service. Close field supervision of every Homelite unit is a part of Homelite service. If you ever need repairs, there's a trained Homelite representative near you . . . ready for your call . . . ready to give you instant repair service in the field or in his completely stocked shop.

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Blowers • Chain Saws
• Paving Breakers

PERFORMANCE · DEPENDABILITY · SERVICE

HOMELITE
CORPORATION
209 RIVERDALE AVENUE • PORT CHESTER, N. Y.

No. 261 of a series

Railway Engineering and Maintenance

SIMMONS-BOARDMAN PUBLISHING CORPORATION
79 W. MONROE STREET
CHICAGO 3, ILL.

Subject: Your Reading Habits

September 1, 1950

Dear Readers:

Among the letters received from readers during the last month was one which indicated that the author had read the August issue practically from cover to cover. In all probability others of you read this issue with equal thoroughness. What was significant about this particular letter was that it indicated the writer has the habit of maintaining an analytical—almost critical—attitude while reading. It seems to us that this is extremely important if you are to derive the maximum value from your reading of this or other magazines or books.

We know from the comments made by this particular reader that he makes the most of his reading time. He is not satisfied simply to read for the passive knowledge which he will gain thereby. He wants to gain knowledge that he can put to active use. This means that he must weigh, evaluate and relate what he reads. As he reads various questions arise. Is a particular practice described superior or inferior to methods in use on his road? If superior, can it be adopted as such, or in modified form, to improve the performance of his own forces? What other lines of reasoning are suggested that might possibly lead to profitable conclusions?

Such reading is a dynamic, rather than a passive, procedure. True, it requires more time, but the greater benefits realized are all out of proportion to the additional time expended. In fact, it is unquestionably more profitable to read only a few articles with this analytical attitude than it would be to read an entire issue in a careless or indifferent manner.

Why not take a moment to examine impartially your own reading habits? If you find that you are inclined to be a non-critical reader, I would like to make a suggestion, namely, that you select an article in this issue dealing with a subject in your particular field of activity and read it carefully, critically and analytically. Then decide for yourself if you haven't profited to a greater extent than if you had read it in the usual manner. You may be surprised.

Yours sincerely,

Merwin H. Dick

MHD:ag

Editor

MEMBERS: AUDIT BUREAU OF CIRCULATIONS AND ASSOCIATED BUSINESS PAPERS, INC.

It's NEW... It's *News!*

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. . . and the half-century that slowed the clock

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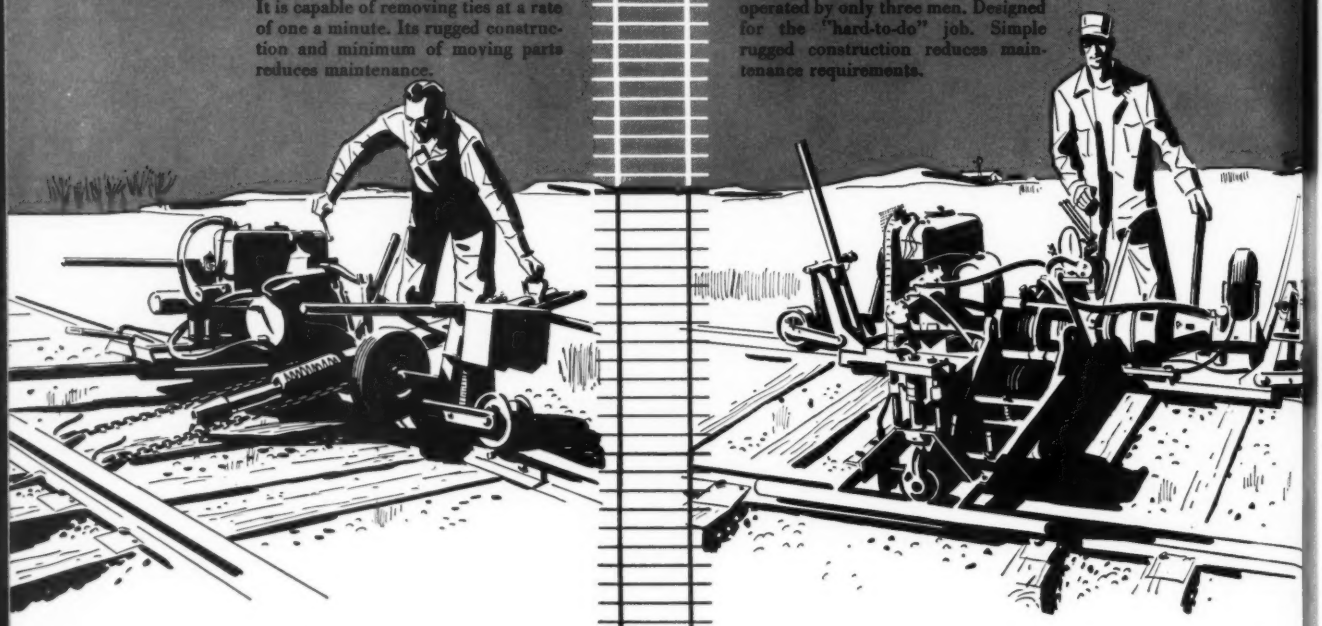

If a foreman who worked America's railroads at the turn of the century were to hold his watch on any of the industry's *modern* routine maintenance jobs—such as tie renewals, weed control, ballast drainage, etc.—he would no doubt think that time had slowed his watch's hands.

For during that half a century, the steel muscles of machinery have unburdened the backs of man—and have helped to speed maintenance and repairs many, many times over.

To Fairmont, must go a generous share of credit for this accomplishment. For almost every major development in roadbed maintenance during the past 40 years owes much to Fairmont's pioneering.

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Performance
ON THE JOB
COUNTS

Railway Engineering and Maintenance

NAME REGISTERED U. S. PATENT OFFICE

VOL. 46, NO 9 SEPTEMBER, 1950

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RAMAPO AJAX DIVISION
109 North Wabash Avenue, Chicago 2, Ill.

The Fixed Plant —

May Need Attention Along with the Car Supply

The freight-car situation has come in for a great deal of attention since the war in Korea produced the threat of another global conflict. Railroad men, shippers, and representatives of government agencies have all expressed concern that the present supply of freight cars is far below that which would be needed in the event of another war, or if the country should undertake a war-preparation program on any considerable scale. The result has been a veritable avalanche of orders for new freight cars.

On the other hand there has been hardly a whisper of concern regarding the condition of the fixed properties. These properties are as much a part of the transportation machine as is the rolling stock, and it is just as necessary that they be maintained to the standards necessary to handle peak loads of traffic safely and efficiently. It is true that the car supply is a factor of more immediate concern, but sooner or later some serious thought must be given the question of assuring that the tracks and other parts of the fixed plant will be adequately maintained for any emergency. In fact, the wiser course would be to appraise this situation now rather than to wait until later when materials and manpower may be in such short supply as to make it impossible to take adequate remedial measures.

While conditions vary widely as between individual railroads, there is little question but that the average fixed-property condition of the roads as a whole is far from satisfactory to weather the ordeal that may lie ahead. It is an established fact that, speaking generally, the condition of the tracks suffered some deterioration during World War II and has lost further ground since that conflict came to an end.

These statements are verified to some extent at least by figures on deferred maintenance compiled by the Engineering Section of the Interstate Commerce Commission's Bureau of Valuation. According to these figures the accumulated deferred maintenance on the Class I railroads as of December 31, 1949, was $875,000,000, all in fixed-property items. A year previously the estimated figure was $560,000,000, also all in fixed-property items. The items in which the largest amount of deferred maintenance was found included ties, rail, other track materials and track laying and surfacing. In 1949, strikes in the coal and steel industries caused rail and tie renewals to be sharply curtailed, with the result that the estimated deferred maintenance that occurred in these items alone during that year amounted to $110,000,000. It is not unlikely that 1950 will see a further increase in the amount of deferred maintenance in these important items.

What these figures mean is that, speaking generally, the tracks of our railroads are continuing to deteriorate, year by year, in relationship to the demands made upon them. Conceivably, this could result in a dangerous situation if the railroads were suddenly called upon to handle a vastly increased volume of traffic while at the same time having to cope with severe shortages of men and material. Railway maintenance officers are the persons best able to judge the condition of their individual properties in the light of this situation. If these properties are found to be dangerously below par, assuming the possibilty of a major conflict in the near future, then it is the responsibility of these officers to do what they can to remedy the situation.

Track and

A. G. Reese
President
Roadmasters' and Maintenance of Way Association

W. F. Martens
President
American Railway Bridge and Building Association

Annual meetings of the Roadmasters' Association and the American Railway Bridge and Building Association are to be held at the Hotel Stevens, September 18-20. Interesting joint sessions, a banquet, a record exhibit, and inspection trips will add spice to the proceedings.

• The biggest annual events in the business lives of track and bridge and building supervisory officers are about to take place at Chicago. These are the annual conventions of the Roadmasters' and Maintenance of Way Association and the American Railway Bridge and Building Association, which will be held at the Stevens Hotel, September 18-20. The conventions will convene in a joint session on Monday morning, September 18, after which the groups will separate to hold individual sessions. However, on Tuesday afternoon there will be another joint session at which a number of outstanding addresses will be heard.

The complete programs of the two conventions, including the joint sessions, are presented below. The reports of the technical

Programs

Concurrent Annual Conventions of the Roadmasters' and Maintenance of Way Association and the American Railway Bridge & Building Association

HOTEL STEVENS, CHICAGO, SEPTEMBER 18-20, 1950
(All Sessions Chicago Daylight Saving Time)

JOINT SESSIONS
MONDAY, September 18

*10:00 a.m.—Joint conventions called to order.
Welcome by presidents of the Roadmasters' and B.&B. Associations.
Greetings from the American Railway Engineering Association.
Greetings from the Track Supply Association.
Greetings from the Bridge & Building Supply Men's Association.
*10:30 a.m.—Opening address by J. H. Aydelott, vice president, Operations and Maintenance department, Association of American Railroads.
*10:45 a.m.—Joint announcements.
*10:50 a.m.—Adjournment to the separate sessions of the two Associations.

ROADMASTERS' SESSIONS

11:00 a.m.—Address by President A. G. Reese
11:30 a.m.—Report of Committee on Power Tamping Equipment and Its Effectiveness — J. R. Kanan, chairman (assistant engineer track, Colorado & Southern, Denver, Colo.)
12:15 p.m.—Report of Committee on Improved Methods Used in Surfacing and Raising Tracks to Grade and Line Stakes—L. W. Howard, chairman (assistant valuation engineer, Illinois Central, Chicago)
1:00 p.m.—Adjournment to visit the exhibit

BRIDGE & BUILDING SESSIONS

11:00 a.m.—Address by President W. F. Martens
11:20 a.m.—Report of Committee on Concrete Piles in Bridge and Pier Construction—J. F. Warrenfells, chairman (master carpenter, Seaboard Air Line, Savannah, Ga.)
12:00 p.m.—Report of Committee on Mechanization and Specialization of Forces—R. R. Gunderson, chairman (assistant bridge engineer, Southern, Washington, D. C.)
1:00 p.m.—Adjournment to visit the exhibit

TUESDAY MORNING
September 19

9:30 a.m.—Report of Committee on Methods of Organizing, Equipping and Operating Rail-Renewal Forces—P. R. Matthews, chairman (assistant division engineer, Chesapeake & Ohio, Ashland, Ky.)

9:30 a.m.—Report of Committee on Construction and Maintenance of Station Platforms—L. C. Winkelhaus, chairman (architectural engineer, C.&N.W., Chicago).

B. & B. Men to Head for Chicago

committees—six for the Roadmasters and seven for the Bridge and Building group—will occupy the greater part of the program of each association. An innovation, introduced for the first time this year, will be the adjournment of both meetings at 1 p.m. on Monday to allow ample time to view the record exhibit of manufacturers' products that will be on display at the Coliseum. The presentation of the committee reports, the time allowed to view the exhibit and the conduct of routine business will leave no time for special addresses during the Bridge and Building Sessions and for only one address during the Roadmasters' session. This will be an address on Reducing Unproductive or Travel Time of Maintenance of Way Forces, by H. W. Kellogg, division engineer, Chesapeake & Ohio (Pere Marquette district), Detroit, Mich., and will be presented as the final item on Tuesday morning.

The outstanding feature of the joint opening session on Monday will be an address by J. H. Aydelott, vice-president, Operations and Maintenance department, Association of American Railroads. The joint session on Tuesday afternoon will be headlined by an address on The Role of Supervision in the Present World Crisis, by J. P. Newell, general manager, Pennsylvania, Western region, Chicago. During this same session, L. W. Horning, vice-president, personnel and public relations, New York Central System, will speak on Personal Relations as an Aid to Greater Efficiency, and L. B. Harper, personnel assistant, Illinois Central, Chicago, will address the combined groups on The Supervisor's Approach to the Safety Problem.

One of the highlights of the convention will be the banquet, to be held on Wednesday evening, at which the members of both associations and their families will be the guests of the Track Supply Association and the Bridge and Building Supply Men's Association.

The session of the Roadmasters' Association will be presided over by the association's president, A. G. Reese, district maintenance engineer, Chicago, Burlington & Quincy. The meetings of the Bridge and Building Association will be directed by its president, W. F. Martens, general foreman bridges and buildings, Atchison, Topeka & Santa Fe, San Bernardino, Cal.

TUESDAY MORNING (Cont'd)

10:15 a.m.—Report of Committee on Desirable Revision in the Organization of Track Maintenance—L. C. Blanchard, chairman (roadmaster, Chicago, Milwaukee, St. Paul & Pacific, Mitchell, S. D.)

11:00 a.m.—Address on Reducing Unproductive or Travel Time of Maintenance of Way Forces, by H. W. Kellogg, division engineer, Chesapeake & Ohio, Detroit, Mich.

10:15 a.m.—Report of Committee on Types of Treated Lumber and Uses in Building Maintenance and Construction—R. W. Cassidy, chairman (supervisor of bridges and buildings, C.&O., Peru, Ind.)

11:00 a.m.—Report of Committee on External Protection from Corrosion for Pipe Lines—H. E. Graham, chairman (assistant superintendent water service, I.C., Chicago).

TUESDAY AFTERNOON

*2:00 p.m.—Address on The Role of Supervision in the Present World Crisis, by J. P. Newell, general manager, Pennsylvania, Western Region, Chicago.

*2:30 p.m.—Address on Personal Relations as an Aid to Greater Efficiency, by L. W. Horning, vice-president, personnel and public relations, New York Central System.

*3:00 p.m.—Address on The Supervisor's Approach to the Safety Problem, by L. B. Harper, personnel assistant, Illinois Central, Chicago.

TUESDAY EVENING

(Grand Ballroom—Informal)

*6:30 p.m.—Joint Annual Banquet of the Roadmasters' and Bridge & Building Associations—With Supply Associations.

WEDNESDAY MORNING
September 20

9:30 a.m.—Report of Committee on Construction and Maintenance of Highway Grade Crossings—H. M. Overpeck, chairman (roadmaster, Elgin, Joliet & Eastern, Joliet, Ill.)

10:15 a.m.—Report of Committee on Various Methods of Ballast Cleaning and Renewal—W. H. Haggerty, chairman (track supervisor, New York, New Haven & Hartford, New Rochelle, N. Y.)

11:00 a.m.—Business Session.
Election of officers.

9:30 a.m.—Report of Committee on How to Sell Accident Prevention to the Man in the Gang—E. H. Blewer, chairman (assistant to superintendent safety, N.Y.C., New York).

10:15 a.m.—Report of Committee on Installing and Maintaining Waterproofing on Ballast-Deck Bridges—F. J. A. Leinweber, chairman (bridge and building master, Canadian National, St. Thomas, Ont.)

11:00 a.m.—Business session.
Election of officers.

WEDNESDAY AFTERNOON

12:15 p.m.—Bus trip to inspect the frog and switch shop at Chicago Heights of the Ramapo-Ajax division, American Brake Shoe Company.

12:45 p.m.—Bus trip to inspect the new laboratory of the Portland Cement Association at Skokie, Ill.

*Joint Sessions (will be held in North Ballroom).

Record-Breaking Exhibit by Two Supply

G. R. Betts
President
B. & B. Supply Men's Association

Kenneth Cavins
President
Track Supply Association

E. C. Gunther
Secretary
B. & B. Supply Men's Association

• The greatest opportunity ever afforded to inspect an exhibit of materials, devices and equipment available for use in the construction and maintenance of railway tracks and structures will await the railway men attending the Roadmasters' and Bridge and Building conventions in Chicago, September 18-20. At this exhibit in the Coliseum, sponsored jointly by the Track Supply Association and the Bridge and Building Supply Men's Association, a total of 121 member manufacturers will display their products in 248 booths. These figures compare with the previous record of 93 exhibitors and 157 booths established during the 1948 joint exhibit at the Stevens Hotel. Not only is this joint exhibit to be the largest ever held, but the space reserved by individual manufacturers is, in many cases, the greatest ever used to present their products.

This record breaking exhibit is being directed jointly by Kenneth Cavins (Fairmont Railway Motors), president, and Lewis Thomas (Q & C Co.), secretary-treasurer, Track Supply Association; and by G. R. Betts (Armco Drainage & Metal Products, Inc.), president, and E. C. Gunther (Duff-Norton Manufacturing Company), secretary, Bridge and Building Supply Men's Association. Mr. Thomas has served also as director of exhibits.

A list of the companies participating in the event, with their booth numbers, the products to be displayed and the representatives who expect to be on hand, is presented here, together with a floor plan showing the exhibit spaces.

List of Exhibitors

Achuff Railway Supply Company, St. Louis, Mo.—Rail anchors; tie-saver track pad. G W. Achuff, H. G. Rowe, A. Milton Wells; **Space 14.**

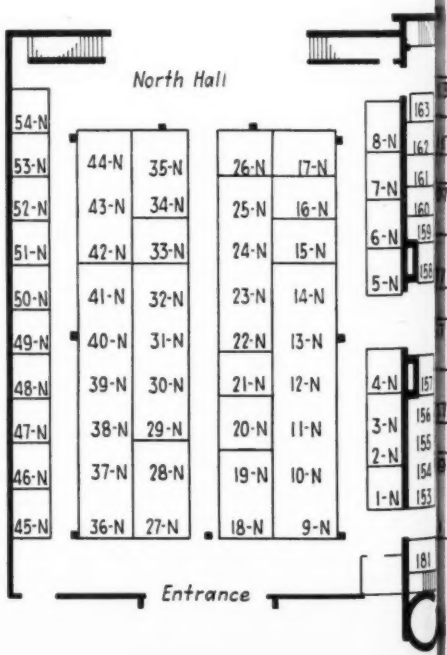
Air Reduction Sales Company, New York—Machine for flame hardening rail ends; flame-cleaning torches; tips; regulators; and hardfacing alloys. C. A. Daley, D. E. Dallman, J. W. Kenefic,, L. C. McDowell, U. F. Portell, R. A. Rex, W. P. Rogers, D. J. Williams; **Space 100-101**

Allis-Chalmers Manufacturing Company, Milwaukee, Wis.—Crawler tractor with blade and shovel; crawler tractor with scarifier and bulldozer; wheel tractor with mower; motor grader with loader and scarifier. Don D. Kennedy, H. J. Masuhr, G. P. Molzahn, Wallace P. Richmond, James Scoggin; **Space 36N-37N-38N-39N-40N-41N.**

American Brake Shoe Company, Ramapo Ajax Division, Chicago—Tie-plate anchor studs; switch stands; rail lubricators; guard-rail tie plates; integral base crossing; vertical switch rods; switch points, stock rails and fittings; rail braces; switch-point lock. R. A. Burt, O. Bengston, G. A. Carlson, R. L. Carmichael, C. P. Corrigan, E. E. Dailey, T. F. Egan, R. M. Evans, C. E. Godfrey, H. Hazelton, Jr., A. F. Hess, D. F. Hilton, A. F. Huber, K. D. Hughes, J. S. Hutchins, J. V. Houston, G. J. Killmer, H. G. Kirley, J. P. Kleinkort, O. F Magnus, L. I. Martin, W. A. Maxwell, R. L. McAbee, J. McComb, W. C. Muller, E. F. Needham, H. W. Renick; **Space 37-38-39-40-41.**

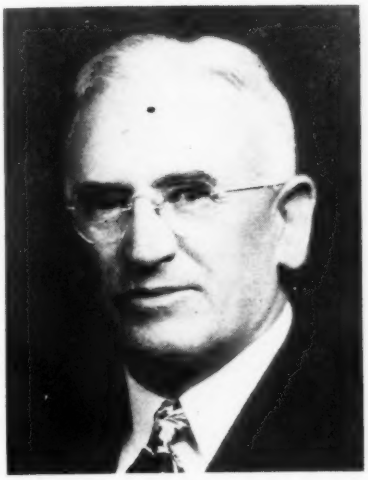
American Hoist & Derrick Co., St. Paul, Minn.—Display of transalites comparing an old steam locomotive and the first locomotive crane built by American Hoist with a Diesel locomotive and a 25-ton Diesel-electric locomotive crane. H. B. Brooke, S. C. Brown, J. E. Carroll, George Cooper, L. E. Coulter, George Dallas, Clarence Gush, J. F. Hartley, John Hogan, S. M. Hunter, E. L. McCabe, E. S. McCormick, Ralph W. Payne, Stanley H. Smith, Conroy W. Wilson, L. W. Whittaker, J. D. Zook; **Space 2N-3N.**

American Lumber & Treating Co., Chicago—Pressure-treated lumber. H. W.

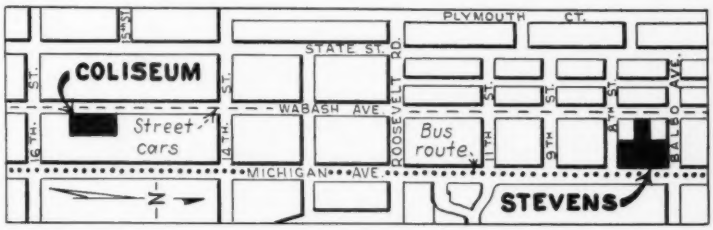


The manufacturers' products shown in bold-face type are those introduced since January 1.

Associations



Lewis Thomas
Secretary
Track Supply Association



Don't Miss the EXHIBIT

WHERE: Coliseum, 1513 South Wabash avenue

WHEN:* Monday — 9:00 a.m. to 6:00 p.m.; Tuesday — 9:00 a.m. to 5:00 p.m.; Wednesday—9:00 am. to 6:00 p.m.

HOW TO GET THERE: (1) Any motor-coach bus (fare 13 cents) numbered 1 to 6 going south on Michigan avenue. Get off at Sixteenth street.

(2) Any street car (fare 15 cents) going south on Wabash. Get off at Sixteenth street.

ADMISSION: By railroad employee pass or free pass obtainable at convention registration desk at Stevens hotel.

*Central Daylight-Saving Time

Angell, R. R. Clegg, J. E. L. McCall, R. B. Putman; **Space 59.**

American Structural Products Company, Toledo, Ohio—Various types of glass block, including a new light-directing, azimuth-correcting block. Harry C. Fowler; **Space 138.**

Armco Drainage & Metal Products, Inc., Middletown, Ohio—Foundation pipe piling; liner plate; multiple-plate pipe; asphalt-asbestos bonded pipe; pipe end sections; helically corrugated perforated pipe; bin walls; prefabricated steel buildings; sheeting. C. H. Anderson, G. R. Betts, Fred Bolton, Herbert Clark, Jr., H. S. Claybaugh, E. T. Cross, V. W. Davis, J. D. Faylor, C. L. Fisher, J. R. Hursh, W. P. Lipscomb, J. S. Loeffler, N. A. Powell, Karel A. Smith, W. H. Spindler, R. N. Tracy, Felix W. Truss; **Space 26-27.**

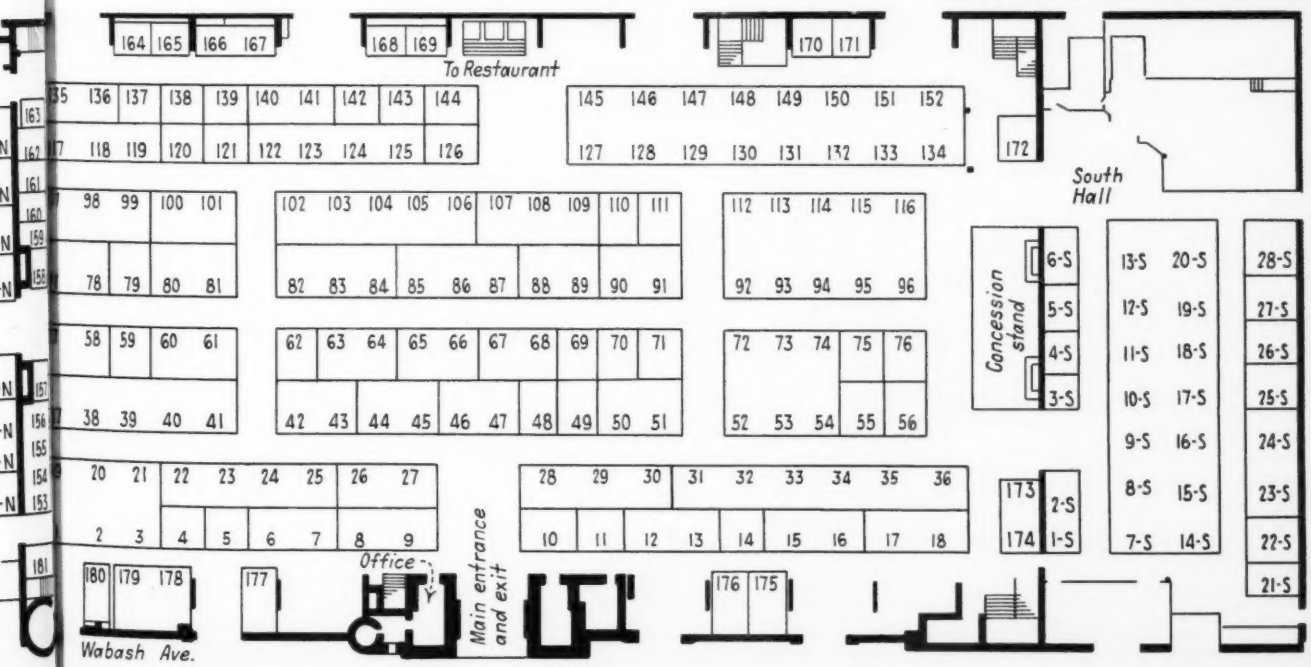
Austin-Western Company, Aurora, Ill.—Large photographs of air dump cars; air-operated model of dump car. Jess Mossgrove, George Sines; **Space 70.**

Barco Manufacturing Company, Chicago—Flexible-ball pipe joints; gas-operated unit tampers, hammers, drillers, rammers and spike drivers; Diesel fueling and tank-car unloading arrangements. F. N. Bard, B. H. Ferguson, C. O. Jenista, W. T. Jones, L. J. Lytle, J. L. McLean, and C. L. Mellor; **Space 49.**

Benbow Fence Tightener Company, Benbow, Cal.—Fence tightener. Robert Benbow; **Space 164.**

Bernuth, Lembcke Company, Inc., New York—Tie-plate lock spikes; tie-plate anchor spikes. A. C. Jack; **Space 69.**

Floor plan of Chicago Coliseum, showing the space numbers of the exhibitors



New Products To Be Displayed

On these pages is presented a pictorial record of some of the many new machines, materials and devices introduced since January, 1, which will be shown at the Coliseum during meetings of the Roadmasters' and Bridge & Building Associations

Tie remover—Fairmont Railway Motors, Inc. Operated hydraulically, handled by two men, said to remove a tie a minute. Space 127 to 134 and 145 to 152, incl.

Tie inserter—Fairmont Railway Motors, Inc. Companion unit of the tie remover (above). Operated by two men. Space 127 to 134 and 145 to 152, inclusive

Spot-Air Compressor—Ingersoll-Rand Company—A portable unit which will operate four tamping tools. For detailed description see page 865. Space 28-29-30

Bird & Son, Inc., East Walpole, Mass.—Tie pads; sections of crossties with and without pads; rugs; linoleum tile; duotone linoleum tile; rubber-like runner; shingles. A .H. Anderson, C. A. Boiteau, W. J. Brebach, J. A. Crowe, A. M. Dobbins, J. H. Dooling, E. Gach, C. R McNay, E. F. Murphy, S. R. Reid, Jr., F. P. Reynolds, T. J. Sullivan, W. W. Wilson, R. A. Wohlberg; Space 42N-43N-44N

Brainard Steel Company, Warren, Ohio—Literature and pictures of strapping-methods of packaging, handling and distributing crossties. E. W. Bonekamp, J. D. Boyer, F. E. Houck, M D. Rector, S. A. White; Space 54N

Branson Instruments, Inc., Stamford, Conn.—Rail flaw detector in operation. Peter K. Block, Norman G. Branson; Space 6S.

Brice Hayes Company, Chicago—Dumping units for push cars or trucks; spike locks, fence anchors. T. F. Braffett, Brice Hayes, Reuben Skanse; Space 21S.

Briggs & Stratton Corp., Milwaukee, Wis.—Several models of gasoline engines. J. H. Ebershoff, F. R Maloney., E. A. Grede; Space 4S

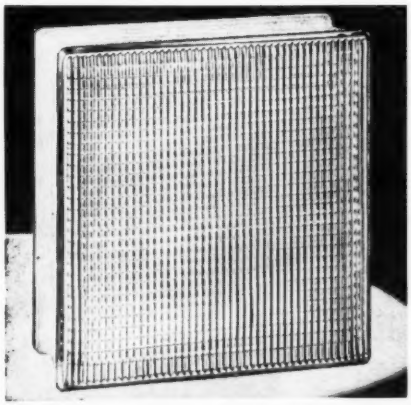
Buda Company, Harvey, Ill.—Roadbed grouter; power track drill; rail bender; track liner; bonding and track drills; track and lifting jacks; small Diesel-electric generator set. E. Broholm, H. H. Cohenour, L. W. Cultice, Lee C. Daniels, R. Dickinson, W. A. Hart, L. O. Kerlin, Foster Lamb, C. A. Leetz, F. J. McMahon, R. J. Mulroney, D. Price, K. Preisel, H. E. Roth, M. J. Rotroff, J. W. Sanford, C. W. Smith, R. P. Williamson; Space 42-43

F. Burkart Manufacturing Company, St. Louis, Mo.—Tie pad. Arthur L. Bartlett, A. E. Botts, C. L. Burkart, C. Todd Clark; Space 38

Caterpillar Tractor Company, Peoria, Ill.—Three tractors and an engine, plus tractor attachments made by three allied manufacturers. J. M. Abbey, K. F. Ames, R V. Bradley, F. D. Haberkorn, Al Hoben, Russ Johnson, C. E. Jones, F. E. Schaumburg, B. R. Shelley; Space 92-93-94-95-96-112-113-114-115-116

Chain Belt Company, Milwaukee, Wis.—A concrete pump in operation pumping concrete through a 12-ft pipe-line loop; films showing the concrete pump in use on bridge, building and tunnel-lining jobs; colored "on-the-job" pictures of pavers, truck mixers and water pumps; and a building mixer. J. J. Conrick, A. W. Forrett, R. M. Hawkins, Jack Heaps, D. A. Kalton, W. B. Marshall, A. E. Schmidt, A. K. Thomas; Space 22N-23N-24N-25N.

Chattanooga Welding & Machine Co., Chattanooga, Tenn.—Ballast cleaner literature. M. L. Holt, S. F. Judd, Frank Wright; Space 169



Light-directing glass block—The American Structural Products Company. Space 138

Chicago Pneumatic Tool Company, New York—Air compressors; gasoline unit tampers; pneumatic tampers; spike drivers; drills; wood borers; impact wrenches; grinders; electric tools; and speed recorders. J. J. Brown, C. L. Butler, G. J. Coffey, S. A. Congdon, H. R. Deubel, T. P. Harris, J. E. Hopping, C. D. Nicholls, Wm. Pallowick, E. S. Rosselle; Space 57-58.

Chipman Chemical Company, Inc., Bound Brook, N. J.—De-icing grease and liquids; weed-killing service. R. B. Coleman, L. E. Harris, C. S. Langdon, N. J. Leavitt, W. H. Moyer, R. W. Rake, A. J. Reading, J. D. Sandberg, D. A. Zanette; Space 48

Cullen-Friestedt Company, Chicago—Animated display of new rail crane simulating the handling of a 78-ft. rail; motion pictures of cranes in operation. K. J. Beller, L. B. Bertaux, C. J. Bronez, Max Chudleigh, E. V. Cullen, F. J. Cullen, F. P. Cullen, C. G. Edwards, T. G. Frazee, W. D. Hoffman, R. M. Johnson, J. F. Leonard, H. M. McFarlane, E. F. Poe, T. H. Preisker, G. G. Prest, W. J. Roehl, J. E. Simkins; Space 65-66.

Davey Compressor Company, Kent, Ohio—Gasoline-driven portable air compressor. L. W. Darling, J. T. Myers, H. S. Nicholson; Space 139.

Dearborn Chemical Company, Chicago—Pictorial display of rust-preventive applications on rail joints, track fastenings, rail in tunnels, rail through station platforms, road crossings, bridges and turntables; waterproofing of concrete bridge decks, abutments and piers; underground protection for pipe; applicator for joint-bar filler. D. B. Bishop, R. A. Carr, E. M. Converse, E. P. Fager, L. E. Flinn, H. E. Johnston, F. H. Kuhlmann, D. D. Powers, C. C. Rausch; Space 44-45.

Dow Chemical Company, Midland, Mich.—Brush-killing chemical; grass-killing chemical, weed-killing chemical and pentachlorophenol wood preservative. William Melching, George Olson, William F. Richards, Hillard Smith; Space 33N.

Duff-Norton Manufacturing Company, Pittsburgh, Pa.—Track jack; bridge jack; car jack; locomotive jacks; aluminum track jack;. C. R. Ellicott, D. F. Evans, W. I. Floyd, J. Gilchrist, Jr., E. C. Gunther, T. C. Hammer, T. W. Krueger, J. F. McCartney; Space 50-51.

Eaton Manufacturing Company, Reliance Division, Massillon, Ohio—Complete line of spring washers for track, frogs and crossings; narrated motion picture depicting manufacture of spring washers. E. D. Cowlin, S. E. Cowlin, C. A. Esinhart, R. F Golden, E C. Gross, Sr., E. C. Gross, Jr., E. J. Helline, F. K. Howell, R. B. Little, W. B. Moss, A. H. Weston; Space 178-179.

Electric Tamper & Equipment Co., Ludington, Mich.—Motion pictures of multiple tampers in use; enlarged photographs of vibratory tamping equipment. R. L. Banks, W. T. Bloomfield, H. W. Cutshall, Charles J. Derler, G. H. Haywood, J. F. Hensel, R. F. Hermann, A. B. Holt, G. L. Glover, C. Jackson, C. Keen, C. R. Leedham, J. T. Lydon, W. J. Meyers, G. J. Morris, L. S. Osborn, H. D. Piper, J. W. Prewitt, M. S. Westlund; Space 122-123-124-125-126

Eutectic Welding Alloys Corporation, New York—Welding equipment of electric and oxyacetylene types.F. Roehll; Space 8N.

Fabreeka Products Company, Boston, Mass.—Samples; installation photographs of compositon materials used to absorb vibration and shock in bridges, turntables, crossings, tunnels, and scales; tie pads for reducing mechanical wear of ties. A. E. Bardwell, W. P. Brennan, F. A. Hoffman, G. H. Marston, A. W. McKaig, R. L. Murphy, F. B. Summers, Jr., W. B. Rogers, Jr .; Space 173-174.

Fairbanks, Morse & Co., Chicago—Motor cars; push and trailer cars; wheels; pumps; electric generating sets; scales; electric motors; portable hand lamps; and illustrations of Diesel locomotives. W. F. Anderson, P. J. Anthony, E. L. Benson, O. H Brauer, E. P. Chase, J. A. Cuneo, L. L. Farris, E. C. Golladay, J. G. Graham, C. O. Gwinn, W. Harzig, C. J. Helmholtz, H. L. Hilleary, D. Hopkins, J. S. King, C. S. Konzelmann, R. F. Lane, O. O. Lewis, J. F. Marquitz, R. H. Morse, Jr., C. B. O'Neil, V. H. Peterson, J. J. Poirier, P. S. Proctor, C. A. Rauch, C. H. Reed, B. H Roberts, N. A. Sproesser, W. H. Turner, C. Van Natta, L. A. Weom, P. S. York, W. C. Zellmer; Space 52-53-54-72-73-74.

Fairmont Railway Motors, Inc., Fairmont, Minn.—Inspection, section and extra-gang motor cars; weed mower; grouting outfit; tie sprayer; power sickle mower; highway-railway motor car; oil spray car; motor car accessories; tie remover; tie inserter; weed spray car; ballast maintenance car. G. F. Adams, O. F. Banke, W. A. Banke, C. P. Benning, C. W. Brhel, W. D. Brooks, O. F. Buscho, K. K. Cavins, C. J. Dammann, D. E. Doolittle, D. L. Duffin, M. Ellenbecker, I. N. Eustis, R. B. Evans, J. S. Furse, Tracy Horn, C. H. Johnson, F. W. Kasper, W. F. Kasper, F. A. Kaup, R. H. McCune, N. J. McDonald, G. E. Neffeler, C. L. Rager, W. H. Ripken, Fred Rose, F. G. Simmons, H. A. Sly, R. W. Stenzel, Ira Sublett, H. W. Templeton, R. G. Wade, W. M. Williamson; Space 127-128-129-130-131-132-133-134-145-146-147-148-149-150-151-152.

G & H Rail Controls, Inc., Kansas City, Mo.—Rail anchors; demonstration of welding machine automatically welding rail-anchor hold-down lugs to tie plates. Frank Daley, C. J. Hunnicutt, Jim Kirk, Ted Wiklund; Space 5N.

Gary Slag Corporation, Chicago—Crushed slag ballast. Loren Chapman, P. J. Mack, R. Newton McDowell, Miss Doshia McKnight, Mrs. Donna Mills; Space 20N.

General Chemical Division of Allied Chemical & Dye Corp., New York—Photographs and projected slides of weed-killer operations; literature on weed-killer formula. R. N. Chipman, A. M. Dean, A. O. Feigin, J. A. Williams; Space 177.

General Motors Corporation, Detroit Diesel Engine Division, Detroit, Mich.—A cutaway model of a 3-cylinder Diesel 2-cycle engine; six-cylinder, 275 h.p. 2-cycle Diesel engine; a four-cylinder, short-base, Diesel, 2-cycle package power unit; plastic-covered demonstration unit which makes visible the operating principles of a torque converter. R. V. Baxley, Gerald R. Holly, Elmer Johnson, Paul Merkert, Lauren H. Wells; Space 27N-28N.

A. J. Gerrard & Co., Melrose Park, Ill.—Portable equipment for banding checked crossties. J. Carter, H. C. Diefenderfer, D. F. Downing, J. Ferlise, J. M. Gerrard, H. Wenk; Space 6N.

Gravely Motor Plow & Cultivator Co., Dunbar, W. Va.—Tractor and various attachments used for maintenance of railway property. Charles E. Grove, H. W. Klein; Space 25S

Hayes Track Appliance Company, Richmond, Ind.—Cushion wheel stop; sliding derail; derail operating stand; photographs and literature describing new and improved bumping posts. R. A. Downing, Sidney P. Hayes, S. W. Hayes, T. E. Kurtz, Paul C. McClure, G. O. Markey, Herbert J. Mayer; Space 76.

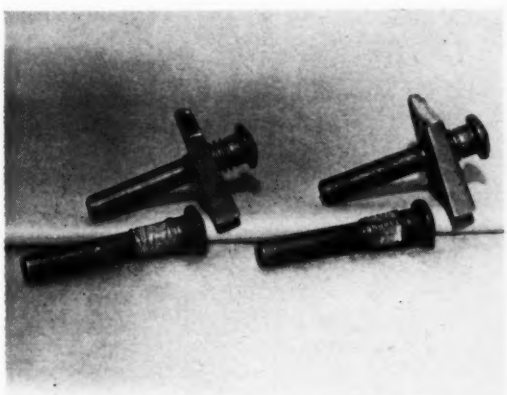
Homelite Corporation, Port Chester, N. Y.—One-man, high-cycle, electric chain saws in three sizes, gasoline-engine-driven chain saws; electric paving breaker; high-cycle electric rail-grinding machine; gasoline-operated generators; gasoline-operated pumps; high-cycle electric tools and floodlights, including tie tampers, impact wrenches, grinders, concrete vibrators, and nut runners. Kenneth J. Clapp, Edward Goodrich, T. W. Gram, L. Niemiec, Nelson Thompson; Space 15-16.

Hubbard & Co., Tool Division, Pittsburgh, Pa.—Spring washers, rail anchors, track tools. A. L. Fridley, J. H. Hines, N. A. Howell, A. C. Laessig; Space 144.

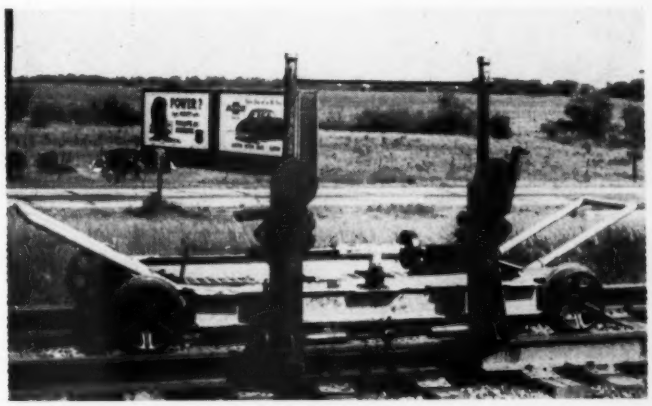
Illinois Malleable Iron Company, Chicago—Rail anchors. Albert C. Ericson, Dayton T. Hogg, Eugene C. Mann, Don N. Roddy, Lloyd O. Stratton; Space 56.

Industrial Brownhoist Corporation, Chicago—Motion pictures of 250-ton Diesel operated wrecking crane; Diesel-electric locomotive crane; ballast cleaners; other products. A. P. Lyvers, W. W. Mossgrove, M. A. Norby, Max Riebenack, III; Space 5.

Ingersoll-Rand Company, New York—Tie-tamping compressors in various sizes including four-tool spot tamper; air and electric impact tools; spike drivers; paving breakers; jackhammers; wood borers; chipping hammers; riveting hammers;



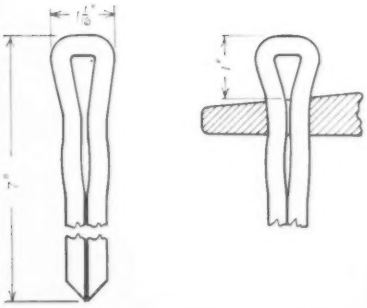
Tie-plate anchor stud—American Brake Shoe Co., Rampo Ajax Div. For details see page 865. Space 37 to 41



Applicator for joint-bar end plugs—Dearborn Chemical Company. Plugs joint-bar openings to prevent entrance of dirt and water. Space 44-45

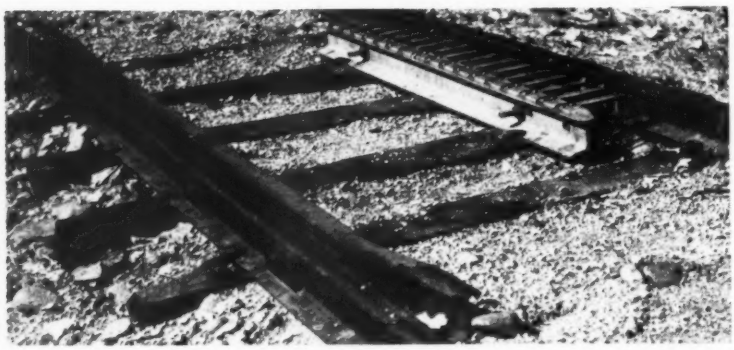
New Products To Be Displayed (Cont'd)

Above—Spray car—Fairmont Railway Motors, Inc. For details see page 864. Space 127 to 134, 145 to 152



Left—Tie plate lock spike—Bernuth Lembcke Co., Inc. Designed to hold plates by spring pressure. Space 69

Below—Broken wheel flange detector —Wheel Checkers. An electrically-operated warning system. Space 180



grinders and other air tools. R. Baldwin, G. Brahler, J. Crocker, E. L. Haase, L. Luther, R. Sampson, G. Williams; **Space 28-29-30.**

International Harvester Company, Chicago—Tractor equipped with mower; tractor equipped with loader and winch; tractor equipped with bulldozer; cutaway Diesel power unit. E. A. Braker, W. H. Kuhlman, L. J. Lange, R. C. Larkin, Dick O'mar, I P. Payne, J. R. Roberts, S. L. Siegfried, Donovan Stevens, W. H. Tudor; **Space 9N-10N-11N-12N-13N-14N.**

Johns-Manville Sales Corporation, New York—Composition pipe; asbestos wallboards; asbestos-composition smoke jack; ready-to-lay roofing; asbestos shingles for roofing and siding; flooring. C. A. Beggs, C. E. Bryant, Jr., G. J. Campbell, S. M. Eaton, Fred Fix, S. H. Flannagan, G. R. Frankland, J. R. Freal, G. E. Hall, W. S. Hough, C. M. Patten, A. C. Pickett, W. W. Prosser, R. P. Townsend, F. C. Vandervort, L. T. Youhn; **Space 153-154-155-156.**

O. F. Jordan Company, East Chicago, Ind.—Model of heavy-duty type spreader-ditcher-snow plow which will be fully operative by means of compressed air to simulate actual operation. James P. Bowers, John J. Dee, L. J. Emmerling, J. C. Forbes, W B. Joyce, Walter J. Riley, William J. Riley, C. W. Shipley, A. H. Witzke; **Space 71.**

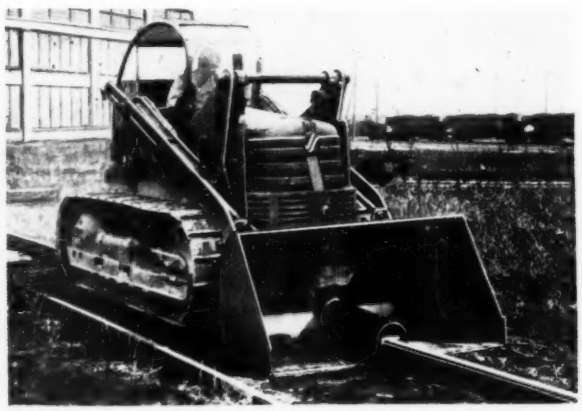
Joyce-Cridland Company, Dayton, Ohio—Aluminum-alloy track and journal jacks; air-motor jacks; automatic lowering jacks; hydraulic jacks; locomotive screw jacks; hydraulic bus and truck jacks; standard speed jacks. Walter S. Bowers, R. C. Brower, Huston Brown, John Miller, Don Switzer, C. N. Thulin; **Space 121.**

Kalamazoo Manufacturing Company, Kalamazoo, Mich. — Extra-light-weight inspection car; model 56A motor car; material handling truck; track levels and gauges; demountable motor-car wheels; differential axles. L. Boxwell, T. C. Coleman, Jr., Stan Haigh, Geo. W. Hoover, Joe Kearney, R. E. Keller, Thomas Mabry, Geo. E. Monroe, Howard Mull, M. J. Orton, Roger Peckinpaugh, P. E. Pettes, Walter Pfeiffer, H. A. Robandt, G. A. Sandberg, Lloyd O. Stratton, J. H. Tuttle, Henry A. Vogel, O. W. Youngquist. **Space 80-81.**

Kershaw Manufacturing Company, Montgomery, Ala.—Ballast regulator and scarifier; scale models of ballast plow and distributor, wheel-type cribbing machine, rail crane, and utility derrick. R. E. Bell, William F. Bevin, R. H. Bigelow, J. W. Davis, Adrian del Paso, Jr., Otis B. Duncan, Carroll G. Holloway, Royce Kershaw, J. D. Lawrence, Vincent Shivers, H. H. Williams; **Space 1S-2S.**

Koehring Company, Milwaukee, Wis.—Shovel; crane with propulsion car; power wheelbarrow; clamshell bucket; photographic enlargements of equipment in action. R. E. Bansemer, J. S.

Ballast regulator and scarifier—Kershaw Manufacturing Co. Equipped with pocketed wings, scarifying teeth. Space 1S-2S



The Lodover—Service Supply Corporation. Combination overhead-loading and front-loading tractor-shovel unit. Space 16N

Conway, Arthur Cossens, G. S. Cox, E. J. Goes, A. E. Kelbe, J. A. Miller, J. R. Steelman; Space 102-103-104-105-106.

Koppers Company, Inc., Pittsburgh, Pa. — Pressure-creosoted timber-panel grade crossings; crosstie sealing compound; crossties and switch ties; examples of pressure-treated timber for railroad application. M. F. Cravey, Douglas Grymes, Jr., R. P. Jackson, E. J. McGehee, J. N. Roche; Space 143

Lehon Company, Chicago — Asphalt roll roofing and shingles; cold-process roofing; hot built-up asphalt roofs; waterproof felts; fabrics and papers; asphalt roof coatings; aluminum paint. T. L. Connolly, J. E. Eipper, E. A. Leonard, A. C. Senseney, J. W. Shoop, H. A. Wolfe; Space 55.

LeRoi Company, Milwaukee, Wis.— Tractor-mounted compressor with eight tie tampers; tractor-mounted compressor with air motor and horizontal earth auger; rock drills, breakers; other air tools. R. E. Bell, R. H. Bell, J. H. Callahan, G. M. Dallas, K. E. Gifford, S. Gunning, W. D. Hoffman, D. J. Hogan, G. M. Hogan, J. E. Hogan, R. M. Johnson, F. E. McGee, R. R. Morgan, J. M. Norton, N. W. Reinker, D. N. Roddy, A. A. Russ, R. E. Schatmeyer, Guy Scrivner, N. M. sedgwick, S. H. Smith, L. O. Stratton, R. H. Watkins, H. B. Zimmerman; Space 67-68.

Link-Belt Speeder Corporation, Chicago—Pictorial display of crawler, truck, and wheel-mounted shovel-cranes in railroad applications. R. B. Barnes, N. V. Chehak, D. W. Lehti, G. H. Olson, G. W. Rowand; Space 120.

Locomotive Finished Material Company, Atchison, Kan.—Cast-steel alloy, self-guarded frog. W. W. Fetner, Norman E. Gillispie, R. L. McIntosh, A. H. Moorhead, H. E. Muchnic, W. H. Muchnic, F. B. Nugent, G. W. Taylor; Space 175.

Lyle Signs, Inc., Minneapolis, Minn.— Railroad signs, reflectorized or plain; including crossing signs, speed-limit signs, and slow-order signs. Clarence Gush, W. R. Walsh, Robert J. Wylie; Space 22S.

Maintenance Equipment Company, Chicago—Power rail layer which is self-propelled only during rail relaying operations; setoff transfer for rail layer; single-rail, rail-and-flange lubricator; blown-up photographs of two-rail, yard-type rail-and-flange lubricator; blown-up photograph of lubricator in track; reversible switch-point protector applied to rail; blown-up photograph of blue-flag derail. E. Overmier, T. E. Rodman, H. V. West, Jr., P. J. Wolf, D. J. Zick; Space 85-86-87.

Mall Tool Company, Chicago—Rail grinders; rail drills; chain saws; concrete vibrators; circle saws. Jack Beven, A. Hawkinson, A. E. Lange, G. E. Norden, Clark Ryan; Space 77-78.

Massey Concrete Products Company, Chicago—R. Clarke, J. K. Lynch, W. Lyle McDaniel, E. M. McMillan, G. H. Redding. Space 160.

The Master Builders Company, Cleveland, Ohio—Display units depicting the "Cavalcade of Concrete". H. L. Andrews, V. S. Andrews, C. H. Borcherding, Jess Fellabaum, W. P. Geiser, F. R. Hinds, A. S. Holway, C. A. Lyon, B. R. Wood; Space 117-118-119.

Matisa Equipment Corporation, Chicago—Movies of ballast cleaning and tamping machines in operation; literature. R. A. Baer, L. Cuny-Ravet, I. N. Smith, G. Zuba; Space 34N-35N.

Meade Specialties Company, Chicago—Two very small crawler tractors, pneumatic devices. R. W. Hauenstein, H. O. Henwood, J. Hillsman, A. Kilgen, N. Lieser, E. W. Malek, J. E. Mead, T. E. Mead, H. E. Moorman; Space 45N.

Mid-West Forging & Manufacturing Co., Chicago—Rail anchors. Noble Gibson, J. L. Hench, Ray T. Johnson, Russell Robertson, J. R. Wilson; Space 181.

Modern Railroads Publishing Company, Chicago—Copies of publication. Charles W. Behrens, W. G. Downie, David Glenn, L. R. Gurley, Floyd C. Leverette, Frank Richter, John Sitton, Jack Warmington, D. R. Watson; Space 172.

Morrison Railway Supply Corporation, Metalweld Process Division, Buffalo, N. Y.—Photographs showing the process of welding frogs and crossings; adjustable rail holders; welded pile shoes. G. J. Diver, D. R. Vogel; Space 15N.

Motorola, Inc., Chicago—Handie-talkie 2-way F. M. radiophones; a 30-watt 2-way F.M. mobile radio; front and rear-mount models of uni-channel dispatcher, an F.M. 2-way mobile radio. Floyd McCall; Space 1N.

Murdock Manufacturing & Supply Co., Cincinnati, Ohio—Water service devices; drinking fountain; air valves; check valves; Diesel watering hydrant; hose coupling guards; car wash boxes; street washers. J. H. Ferguson, Eugene LeRoy, G. B. Lawrence, J. Kelso Murdock, H. F. Oswald, Eugene Riddle, D. B. Totten, John Vogler; Space 28S.

National Lead Company, New York—Paint products. Ralph D. Baker, Jack Boand, W. P. Carney, Walter P. Carroll, Morris D. Cave, George Diehlman, C. Howard Ellis, Ray J. Ferree, W. D. Hickey, Walter R. Maschke, Arthur R. Millas, George Murphy, Paul J. Pater, M. J. Turner; Space 4.

The National Lock Washer Company, Newark, N. J.—Spring washers. M. W. Allen, T. C. Coleman, Jr., D. W. Hallberg, Eugene Harbeck, G. G. Prest, Gilbert E. Webster; Space 104-141.

Nordberg Manufacturing Company, Milwaukee, Wis.—Power wrench; tension meter; spike puller; adzer; power spike hammer; gaging device; rail drill; grinder with rail-drill-bit sharpening accessory; yard cleaning sweeper and loader; cribbing machine; ballast cleaner; power jack; flexible-arm grinder; utility grinder, heavy-duty grinder, midget grinder; 10-hp. Diesel; 20-hp. Diesel engine. D. Anderson, A. W. Banton, W. B. Blix, L. P. Brassy, Z. Chitren, G. M. Cooper, G. M. Dallas, Wayne Downing, H. E. Erickson, J. R. Graham, Stan H. Haigh, James F. Hartley, Hugh Hawkins, J. E. Hogan, J. L. Holman, R. L. Holman, W. S. Isaacs, C. K. Jensch, Eugene Larson, Emil Pages, Ralph W. Payne, Will H. Reaves, E. H. Ricketts, Don N. Roddy, J. W. Samson, R. E. Schatmeyer, Stanley H. Smith, Lloyd O. Stratton, H. H. Talboys, Paul Wagner, Roger Watkins, L. D. Whitaker, W. C. Wilson; Space 7S-8S-9S-10S-11S-12S-13S-14S-15S-16S-17S-18S-19S-20S.

Oliver Corporation, Industrial Division, Cleveland, Ohio—Wheel tractor equipped with loader and mower combination; wheel tractor equipped with hydraulically operated trencher; color movie of wheel tractors in operation. W. E. Chapman, H. W. Davis, W. E. Miles, J. D. Selim; Space 18N-19N.

Oliver Iron and Steel Corporation, Pittsburgh, Pa.—Drive spikes; timber grips; screw spikes; gage rods; track bolts; frog bolts; switch bolts; heel-block bolts; rivets; machine bolts; carriage oolts; lag bolts; drive lags; water-tight bolts, flush-head, freight-car bolts; ribbed body bolts; cap screws; nuts; forgings. John C. Cullinan, George Eskofier, Edw. M. Welty, Carl Wingerson; Space 163.

D. W. Onan & Sons Inc., Minneapolis, Minn.—A 5-kw. air-cooled Diesel generating unit; 3-kw. a.c. portable power unit; 180-cycle engine generator; packaged power plant for caboose. Perry Copeland, Hiram Hascall, Fred Mengelkoch; Space 10.

Oxweld Railroad Service Company, New York—Oxyacetylene apparatus for welding, cutting, flame-cleaning, and flame-hardening; specimens of oxyacetylene pressure-welded rail; flame-cleaned rail and rail ends; flame-hardened rail; built-up rail ends and driver burns. Lem Adams, G. P. Bogert, R. J. Boyle, M. Burnett Jr., W. E. Campbell, S. P. Donegan F. J. Duffie F. M. Finsthwait, F. J. Graham, E. B. Hall, W. A. Hogan, P. Hunter, Jr., A. E. Jacobson, W. Jones, M. E. Keith, R. S. Keins, R. G. Kohn, J. W. Lacey, P. T. McKinney, H. R. Miller, R. J. Nenneman, D. H. Pittman, J. Ritcey, J. H. Rodger, C. R. Strutz, K. I. Thompson, R. W. Torbert, S. Toth, J. E. Winslow; Space 88-89.

P. & M. Co., Chicago—Rail anchors. S. M. Clancey, D. M. Clarke, T. C. Coleman, Jr., J. J. Gallagher, W. J. Garrity, P. H. Hamilton, J. E. Mahoney, J. J. Metzger, C. J. Miller, G. E. Olson, R. W. Payne, W. H. Reaves, M. K. Ruppert, R. C. Schulze, F. R. Wood; Space 90-91.

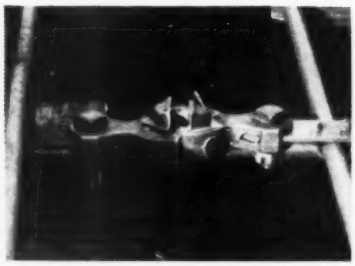
Pacific Coast Borax Company, Los Angeles, Cal—Various borax-type weed-killing chemicals. G. C. Buskirk, J. T. Carroll, J. A. Hyland, R. S. Kiester, W. L. Klatt; Space 17N.

Audigage—Branson Instruments, Inc. For locating web cracks within joint-bar limits. Space 6S

Uni-Channel Sensicon Dispatcher—Motorola, Inc. A two-way F. M. mobile radio unit. Can be mounted under car dashboard or in rear trunk. Space 1N

New Products To Be Displayed (Cont'd)

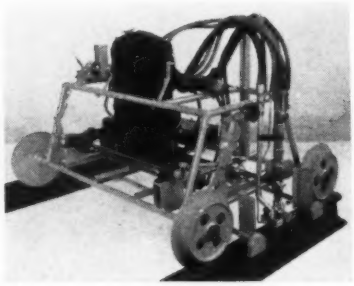
Rubber tie pads and parts for insulated joints—Railroad Rubber Products, Inc. Various types available. Space 5S



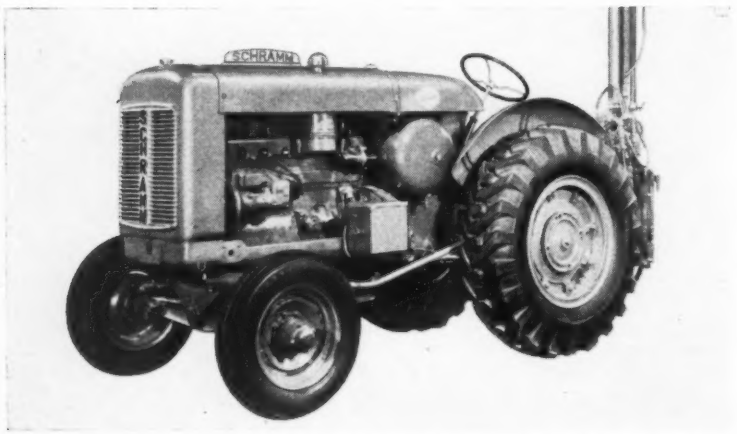
Automatic Motor-Car Coupler—Rydin Railway Equipment Company. Available in steel or aluminum. Space 166-167

Agricat—Earl H. Pence & Co., Inc. Small crawler tractor with bulldozer, disk, bucket attachments. Space 26N

Burro crane with long boom—Cullen Friestedt Company. Detailed description given on page 862. Space 65-66



Rail-end hardening machine—Air Reduction Sales Company. For complete description see page 864. Space 100-101



Pneumatractor — Schramm, Inc. A self-propelled, combination tractor and air compressor. Designed to operate various auxiliary attachments. Space 6-7

Earl H. Pence & Co., Inc., San Leandro, Cal.—Diminutive crawler tractor; tractor attachments. Warren Fenton, Earl H. Pence; Space 26N.

Permacrete Products Corporation, Columbus, Ohio—Precast-concrete crossing slabs; concrete cribbing units; sections of prefabricated concrete buildings. A. E. Botts, A. L. Kaschub, D. V. Maher, J. A. Roche; Space 137.

Pettibone Mulliken Corporation, Chicago—Forged steel adjustable rail braces; spring-switch mechanism; switch stands; hydraulic retarder for spring frogs; re-railing frogs; shoulder bolts; guard rails; spring switch compression gage; bucket loaders; under-car unloaders; conveyors; clamshell and dragline buckets; track cleaner and loader. J. H. Asselin, W. A. Blackford, W. F. Brietzke, W. A. Enstrom, L. Harlacher, E. C. Phillips, E. J. Seifert, G. J. Slibeck, E. H. Sockwell, K. von Kampen, W. B. Weiss; Spare 31-32-33-34-35-36.

Pocket List of Railroad Officials, New York—Copies of Pocket List. John A. Pattee, B. J. Wilson; Space 62.

Power Ballaster Division, Pullman-Standard Car Manufacturing Company, Chicago—Working scale models of the power ballaster, cribber, new cleaner, broom, and tie spacer. Motion pictures in color of machines in use. J. B. Bell, Frank Benko, John Benko, R. C. Caldwell, T. H. Callahan, J. A. Curtis, J. M. Du Bois, H. W. Foster, T. Y. Gehr, G. W. Morrow, F. H. Philbrick and H. D. Richardson; Space 1-2-3-19-20-21.

Q & C Company, New York—Switch-point guard; step joints; alloy and rolled-steel car stops; anti-slip rail tongs; hand-throw derail; sliding-type derail; guard rail clamps; manganese one-piece guard rail; electric switch heater; adjustable rail brace; flangeway guard brackets; gaging tools; gage rods. P. S. Chynoweth, L. E. Hassman, M. Iseldyke, Jr., A. D. Morrow, J. C. Neimeyer, G. G. Prest, S. W. Prest, G. H. Proffitt, Lewis Thomas; Space 111.

Racine Tool & Machine Co., Racine, Wis.—Portable rail saw; unit tampers; rail drill; bonding drill. A. B. Andrews, George W. Christiansen, M. E. Erskine, Stan Haigh, R. B. Hill, Glenn Hunt, E. R. Larson, J. B. Lawrence, E. R. Mason, H. A. Schultz; Space 12-13.

Rail Joint Company, New York—Standard, compromise, and insulated joints; insulating fiber. W. J. Acker, V. C. Armstrong, Alex Chapman, Geo. Clodfelter, E. A. Condit, H. L. Emerson, J. A. Greer, R. W. J. Harris, Sam Harrison, H. C. Hickey, H. L. Lansing, G. H. Larson, J. N. Meade, T. I. Moore, R. W. Payne, Thomas Ryan, J. A. Sadler, E. F. Schermerhorn, J. E. Sporre, F. R. Wood, F. R. Wood, Jr., K. W. Engstrom; Space 60-61.

Railroad Rubber Products, Inc., Ashtabula, Ohio—Rubber tie pads; rubber abrasion pads; rubber rail seats; rubber parts for insulated joints; rubber pads used in crossings for impact and vibration control; rubber bushings for track bolts; sheet rubber; rubber adhesives. N. K. Moses; Space 58.

Rails Company, New Haven, Conn.—Compression-type rail anchors; torque-type rail anchors; special track construction; bridge-tie anchors; kerosene switch heaters; propane-gas switch heaters complete with remote control ignition systems; automatic switch-point locks. R. E. Bell, R. H. Bell, L. T. Burwell, F. W. Gale, F. W. Holstein, W. A. Peck, F. W. Schmidt, and J. V. Wescott; Space 126.

Railway Ballast Conditioning Corporation, Minneapolis, Minn.—Photographs and movies of ballast cleaner in action. M. S. Bestmann, J. M. Frahm, J. T. McMahon, A. R. Menke, O. M. Merry, C. O. Parks, B. E. Struck, D. E. Walters, Wm. R. Walters; Space 176.

Railway Maintenance Corporation, Pittsburgh, Pa.—Multple-tool, track-tamping and surfacing machine; movies and pictures of crib-excavating and cleaning machine; a new, large-size, off-track, shoulder-cleaning machine; other

ballast cleaners. W. R. Boyer, John F. Casey, Jr., M. R. Hoffman, R. M. Jenner, J. B. McWilliams, J. E. Mountford, E. J. Powell; Space 159-97-98-99.

Railway Purchases and Stores, Chicago—Copies of Publication. J. P. Murphy, Jr., E. F. Sheeran, Edward Wray, John E. Wray, Jr.; Space 158.

Railway Track-work Company, Philadelphia, Pa.—Rail-joint cross grinder; rail drill; "walk-off" wheel-barrow type, flexible-shaft grinder; portable rail surface grinder; ballast cribbing machine; rail saw. R. E. Bell, W. H. B. Bevan, Wm. D. Hoffman, Leon E. Hunt, Robert M. Johnson, John B Moore, Fred S. Schwinn, Jr.; Space 107-108-109.

Reade Manufacturing Company, Inc., Jersey City, N. J.—Weed killer; track liner; safety claw bar. G. F. Carpenter, D. M. DeWitt, Charles F. Reade, Charles H. Reade, Leonard J. Reade, Fred Sautter, Charles Sherman, W. L. Tanner; Space 8-9

Rust-Oleum Corporation, Evanston, Ill.—Photos of rust preventive applications and other uses. Russell B. Arnold, Jack Gould, Carl Howard, W. D. Jenkins, H. Fred Jorgensen, Charles W. Matthews, J. C. Simmons, Thomas Smith, John N. Thorp; Space 11.

Rydin Railway Equipment Company, Warrenville, Ill.—Steel and aluminum automatic couplers for motor cars; dummy knuckle suitable for attaching to existing motor-car towing bars; literature. Don Chase, Harry W. Frost, Jr., Fred Gale, Carl N. Rydin, Glenn W. Rydin, J. V. Westcott; Space 166-167

Safety First Shoe Company, Holliston, Mass.—Heavy-duty work shoes with safety steel toes; "street'n-shop" semi-dress styles of safety shoes. A. H. Crafts, John Flegel; Space 27S

Schramm, Inc., West Chester, Pa.—Self-propelled wheel-tractor compressor; self-propelled welder; complete line of pneumatic constructon tools. Fred L. Eckert; Space 6-7.

Service Supply Corporation, Philadelphia, Pa.—Overhead loader for crawler tractor. A. F. Dries, A. C. Farley, S. A. Grubich, H. A. Maloney; Space 16N.

Simmons-Boardman Publishing Corp., Railway Age, Railway Engineering and Maintenance, Chicago—Copies of publications. C. M. Burpee, J. S. Crane, M. H. Dick, R. E. Dove, N. V. Engman, H. H. Melville, W. Merriken, Jr., H. E. Michael, Geo. A. Murphy, Jr., F. W. Smith, John R. Thompson, W. G. Vanderpool, E. E. Williams; Space 162.

Spaulding Fibre Company, Inc., Tonawanda, N. Y.,—Fibre for insulated joints, gage rods and switch rods. R. Rader; Space 168.

Sperry Rail Service, Danbury, Conn.—Ultrasonic detector car for testing rail inside joint bars; literature on rail testing and rail defects. John L. Bradley, James M. Dickey, James W. Eaton, Franklyn E. Farris, John B. Farwell, Herbert E. McCurdy, L. F. A. Mitchell, W. Paul Morrison, Stephen P. Murphy, Raymond E. Sansom, Shirl A. Thompson, Robert D. Walker; Space 82-83-84.

Taylor-Colquitt Co., Spartanburg, S. C.—Animated display of vapor-drying process, cross-sections of vapor-dried materials. W. E. Gadd, D. M. Graves; Space 157.

Teleweld, Inc., Chicago—Literature on service for railroads. W. E. Bugbee, H. E. Finley, C. E. Haman, O. R. Hansen, C. W. McKee, H. E. McKee, J. A. Roche, C. A. Sawyer, S. H. Smith; Space 110.

Templeton, Kenly & Co., Chicago—Complete line of track jacks—including two models with aluminum alloy housings; rail expanders; tie spacers; bridge jacks including jack support; remote-control hydraulic jacks and pullers; ballast pan; tie remover and replacer. W. D. Boldt, L. F. Cooper, R. B. Hill, W. E. Gahl, W. B. Joyce, P. H. McManus, E. Mayes, J. L. McMillan, N. L. Montgomery, G. G. Prest, Wm. Roehl, M. Simpson, W. Simpson, A. C. Templeton, J. B. Templeton, J. L. Tidwell, E. A. Zimmerman, F. H. Zimmerman; Space 46-47

The Texas Company, Chicago—Rail joints lubricated with grease retained by plastic material at ends of bars; grease; rust-proof compounds; shingles and roll roofing; photographs of the rust-proofing of bridges; photographs of asphalt ballast. D. C. Akers, J. K. Brooks, W. S. Custis, J. H. Dugger, H. E. Dyke, C. R. Ehni, J. B. Flynn, J. F. Kane, A. W. Larsen, J. M. P. McCraven, J. J. Roby, E. Wegner, C. H. Weisel, W. E. Wilcox; Space 4N.

Thornley Railway Machine Company, Joliet, Ill.—Track Cribbing machine. Leroy Hasse, F. L. McMillan, E. M. Thornley; Space 170.

Timber Engineering Company, Washington, D. C.—Timber connectors; framing anchors; segmental washers; literature on connectors. Dorothea Ferguson, R. L. Fletcher, L. P. Keith, C. F. Martin; Space 171.

True Temper Corporation, Cleveland, Ohio—Rail anchors; safety rail forks. C. C. Connolly, J. J. Nolan, D. L. O'Brien, F. J. Reagon, Robert Simpson, John Skeel, E. W. Stack, R. J. Whalen; Space 75.

Warren Tool Corporation, Warren, Ohio—Track tools. Karl Bauman, Howard Mull, Oscar W. Youngquist; Space 79.

Wheel Checkers, Denver, Colo.—Working model of broken-wheel-flange detector. W. A. Gieskieng, M. W. Gieskieng, Sr., and M. W. Gieskieng, Jr; Space 180.

White Manufacturing Company, Elkhart, Ind.—Switch heaters with remote control equipment; several models of concrete vibrators and grinders; different types of kerosene torches and burners. Stan H. Haigh, Clarence D. Hicks, Merritt A. King, Edward R. Mason, John A. Roche, W. McK. White, W. McKean White, Jr; Space 135-136.

Whiting Corporation, Harvey, Ill.—Photographic enlargements of drop tables, cranes and car washers. C. A. Geupel, J. O. Munro, A. W. Skinner; Space 161.

Willson Products, Inc., Reading, Pa.—Industrial-safety equipment for protection of ears, eyes, nose and throat; various styles of safety spectacles and goggles for chipping and welding operations; welding helmets; face shields; industrial gas masks and respirators; chip and weld goggles; plastic goggles for general eye protection of workers who may or may not wear prescription spectacles. J. Roy Abel, C. R. Bell, Jr., George Semple; Space 165.

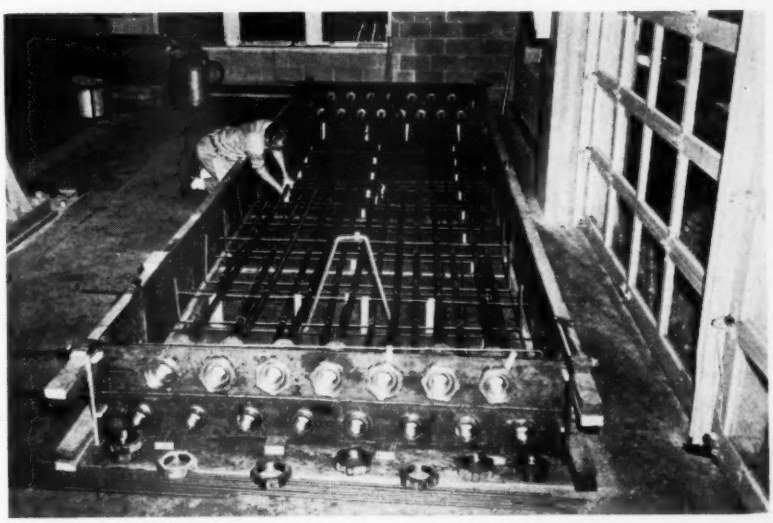
Wisconsin Motor Corporation, Milwaukee, Wis.—Four single-cylinder engines; two 2-cylinder engines and two 4-cylinder engines; a cutaway 4-cylinder engine. H. M. Cronk, Ray J. Fellows, Phil Norton, H. A. Todd; Space 17-18.

Woodings-Verona Tool Works, Verona, Pa.—Track tools; rail anchors; nut locks; springs. R. H. Davis, F. A. Douglass, C. K. Luyster, R. J. McComb, G. L. McKewin, J. M. Moore, G. M. Snyder, W. H. Woodings; Spaces 63-64.

Woolery Machine Company, Minneapolis, Minn.—Tie cutter; weed burner; motor car with flangeway cleaner attachment. A. E. Botts, A. J. Franke, H. W. Lewis, R. J. Moe, W. A. Peck, F. S. Schwinn, Jr., J. R. Smith, L. E. Woolery, W. F. Woolery; Spaces 22-23-24-25.

Young & Greenawalt Co., East Chicago, Ind.—Plain, asphalt-coated, and paved corrugated metal pipe; sectional-plate pipe and arches; structural-plate bridge flooring; tunnel-liner plate; switch heaters; steel buildings. J. B. Bubala, W. P. Greenawalt, W. J. Kelley, D. C. Murrin, J. F. Wysong, J. L. Young; Space 26S.

The Zone Company, Fort Worth, Tex.—Protective-coating method of fire prevention on open-deck bridges and trestles. John A. Roche, Orville Utley; Space 7N.



***TO TEST PRESTRESSED CONCRETE SLAB**—One of the special events planned to take place during the coming convention of the American Railway Bridge & Building Association is an inspection trip to the new laboratory at Skokie, Ill., of the Portland Cement Association. This trip will be made on Wednesday afternoon, September 20, the last day of the convention. Elaborate plans have been prepared to make this inspection interesting and profitable for the members of the associations. One of the events planned will be the testing to failure of a prestressed concrete railroad trestle slab. The test slab will be full size, 25 ft. long, 7 ft. wide and 1 ft. 6 in. deep. It is designed for an E-72 live load, plus impact. The slab was designed and built by the Portland Cement Association, in cooperation with the Association of American Railroads and the John A. Roebling Sons Company. Members of the Masonry committee of the American Railway Engineering Association will also observe the tests. Shown above nearing completion is the form for the slab with the prestressed reinforcing strands in place.*

Office Building Looks to the Future

The enclosure within these movable partitions is occupied by the general yardmaster

Continuous banks of windows that . . .

A modern facility constructed by the Frisco at Springfield, Mo., to accomodate both the terminal and division personnel at that point in one building, features perimeter heating, movable partitions for expanding or reducing room sizes, metal furniture, and harmonious color schemes. Provisions have also been made in both its design and construction to permit the addition of a third story.

• An outstanding example of a functional modern railway building is one recently completed by the St. Louis-San Francisco at its West yard at Springfield, Mo., to house its terminal and division offices. This structure is a two-story buff-colored brick building embodying a number of distinctive features. Among these are a concealed perimeter heating system, architectural-projected windows, movable partitions, wood parquet flooring, metal furniture of modern design, functional built-in cabinets, shelves and closets, and a harmonious color scheme comprised of 62 different colors.

The new office building, 40 ft. by 139 ft. in size, is located at the edge of the right of way where its entrance fronts on a street known as Lexington avenue. Large stainless-steel letters spelling "Frisco" have been placed over this entrance. The rear of the building has three entrances—one leading to a yardmaster's office, another to an engine-crew caller's office and one to the basement locker room for yardman.

The office building, which is of fire-resistant construction, has a full basement and is two stories in height, but provisions have been made in both its design and construction to permit a third floor to be easily added should further expansion be necessary. The basement walls are carried on spread footings and the building proper and floors are supported on an all-welded steel frame of wide-flange columns and beams and of open-truss steel joists. The exterior walls are of structural clay tile faced with brick and the floors are 2-in. concrete slabs on rib-metal lath. These slabs are covered with prefinished wood parquet flooring in all offices, and asphalt tile, laid in harmonious patterns, in the halls. The roof is of the deadlevel type consisting of a 2-in. concrete slab reinforced with rib-metal lath and covered with built-up four-ply roofing. Through-wall flashing was used on the coping wall.

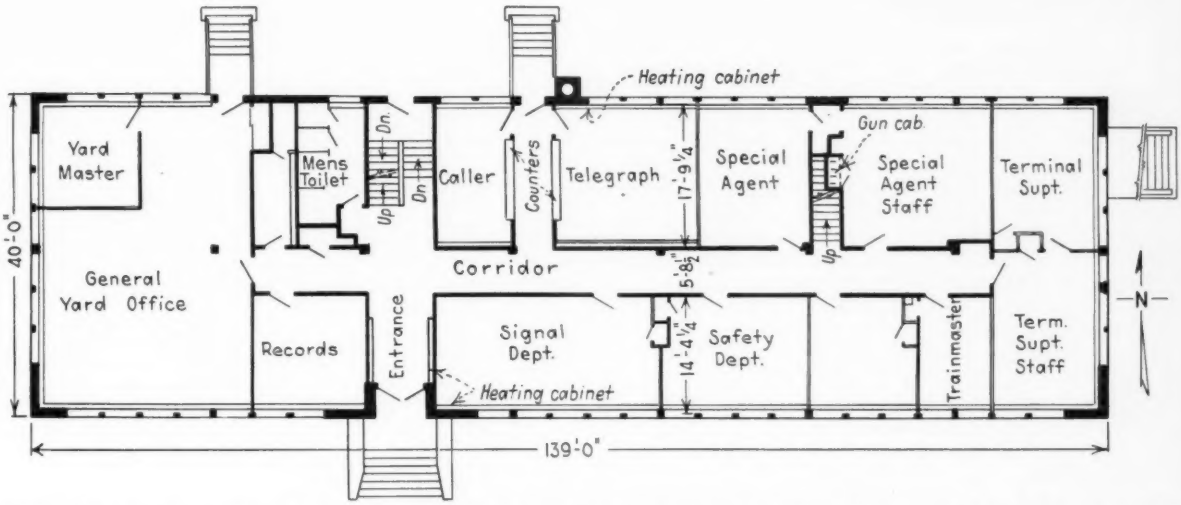
One of the features of this building is the two continuous banks of windows that daylight the interior of the first and second floors. These banks extend entirely around the structure and are unbroken by pilasters or brickwork except at the four corners. The windows are of the architectural-projected type and are set flush with the exterior wall surface.

Uses Movable Partitions

The Frisco more than once had experienced a situation where the usefulness of an office has been impaired by the growth of the staff housed in it. Knowing that the possibility of this happening would be multiplied by the housing of both the terminal offices and division offices under one roof, the road decided to make the new office building as flexible as possible to take care of these contingencies. Hence, the struc-

. . . daylight the interior comprise a design feature of Frisco's new office building

View looking down one of the corridors



First-floor plan of new office building. Walls shown by double lines are movable partitions which permit room sizes to be varied

ture was designed not only to permit the addition of a third floor but also to permit the expansion and contraction of individual rooms by means of movable partitions.

Aside from concrete-block walls in the basement area and the exterior walls, the only fixed walls in the building are those of the entrance hall, the corridors, the stair walls, the C.T.C. battery room, and the toilet rooms. The others are cross partitions that can each be moved by two men in one day. Yet, these partitions are substantially constructed and effectively prevent the transmission of sound through them. Cornice mouldings at the tops of the partitions and at the baseboards contribute to a finished appearance.

To permit such an arrangement, the cross partitions were not erected until after the heating pipes, plumbing, and all floors and ceilings had been installed. Each partition is 1¾ in. thick and is comprised of a cellular core sandwiched between two sheets of Transite. In alternate partitions, two wardrobes were built with their doors facing in opposite directions, so that each room has its own clothes closet.

Room Sizes May Be Varied

The sizes of the rooms may be enlarged or reduced in multiples of 4 ft. 9½ in., which is the distance between centers of the window mullions. All doors in the fixed corridor walls were located so that they would not present a construction problem should any cross partitions be relocated in the future. Also, for the same reason, all light fixtures were placed so that they fall on the window centerliners, while electrical power outlets were located for the most part on the partition walls.

Perhaps the most distinctive feature of the building is the least apparent—its perimeter heating system. On the Frisco this is believed to be the first installation of its kind in such a structure, and the most satisfactory for an office building where the partitions are movable. This system does not remove the moisture from the air and it eliminates all free-standing radiators and hot-air registers. Employing the radiant-heating technique, hot water pipes are enclosed in a continuous, louvered sheet-metal chase within the exterior walls under the windows, and extend completely around the building on each floor level. Hot water for the system is furnished by an oil-fired Kewanee boiler

View of one of the executive-type offices showing the pre-finished wood parquet flooring and the cabinet beneath the windows concealing the perimeter heating

located in a boiler room in the basement.

The hot water leaves the boiler at a temperature of 160 deg. and produces a temperature of about 95 deg. at the radiation surface. The heating system is divided into two primary circuits, one for the east end of the building where the room temperature is controlled by a thermostat in the second-floor C.T.C. room, and the other for the west end of the building where the room temperature is controlled by a thermostat in the first-floor general office of the yardmaster. There are 54 secondary circuits, 18 for each floor and the basement, there being one circuit between each pair of building columns. Heat is radiated from these secondary circuits by means of Vulcan fin-type radiation.

An air-ventilating system was installed for the second floor This was done by dropping the ceiling in the corridor to conceal ducts; installing intake registers in the upper portion of the corridor walls in each room; and drawing the hot air out of the rooms by means of exhaust fans in roof ventilators. An individual blower-type ventilator was installed to handle the air from a C.T.C. battery room.

The continuous heating-pipe chase also encloses all telephone, buzzer, intercommunication and electrical conduits. These communication facilities are made readily accessible at any point by the provision of a removable cover plate installed in the sheet-metal casing around every window mullion and of removable panels in the chase under every window so that, wherever a partition is moved, connections may be easily made without the necessity of any structural changes.

Many Colors Employed

An interesting innovation is the manner in which color has been used on the interior of the structure. Each wall in each office is painted a different color; in all, 62 colors were used throughout the building. All colors and finishes were selected by the railroad's architect so that no two offices have the same colors. Premixed paints were ordered by manufacturer's number and shade to assure the correct color without the additional expense that would be involved if the mixing were done by the painters.

Colors for each office were chosen by taking into consideration the direction the office faces, the function of the office, and the size of the room. In all cases, soft color tones, easy on the eye, were used on walls which office workers face, with a complementary color used on the walls behind them. The interior faces of the outer walls were painted in neutral grays, while the opposite walls were painted in colors harmonizing with the two end walls. Ceilings, being of Acousti-Celotex tile throughout the building, were unpainted. Several colors were used in the corridors for the purpose of increasing the apparent width (actually 5 ft. 8½ in.) and decreasing the apparent length.

In a basement assembly room, capable of seating 256 persons, the wall forming the background for the speaker was painted in a dark gray-green—a color which was selected for its non-glare quality and also to complement the normal flesh tones of the speaker, making him appear to have a robust complexion whether or not he actually has one.

Attention to Details

The Frisco believes that the use of durable construction materials, while they sometimes increase the initial cost slightly, pays off in the long run through reduced maintenance. The road also believes that attention to details in the design and construction reduces the overall cost and provides greater utility. This belief is reflected in the provision of demountable panels in the continuous heating-pipe chases and the sheet-metal mullions for easy access to all vertical and horizontal piping and communication lines—also in the provision made for the quick removal of a line of accoustical tile in the corridor ceiling and for ample working space above for maintenance of the ventilating ducts, electrical wiring, C.T.C. conduits, and a concealed pneumatic-tube system. Furthermore, the building plans have been meticulously detailed so that there will be no question in the future as to the effect that a third story will have on the structure.

Furniture

All offices in this building have been entirely equipped with new furniture. This new office equipment includes both standard and executive-type desks of modern design, tables and file cases—all of metal, with linoleum tops, and of one color. The railroad is now building a small restaurant building of harmonious design near the office building so that employees will be able to procure hot meals at a reasonable cost.

The office building was built under the general direction of H. B. Barry, who retired recently as chief engineer for the road, and was designed by O. H. Tucker, architect for the road, and a member of the American Institute of Architects.

Spraying Weeds from Fence to Fence

In spraying through cuts booms are pulled up by wire stretchers to clear banks

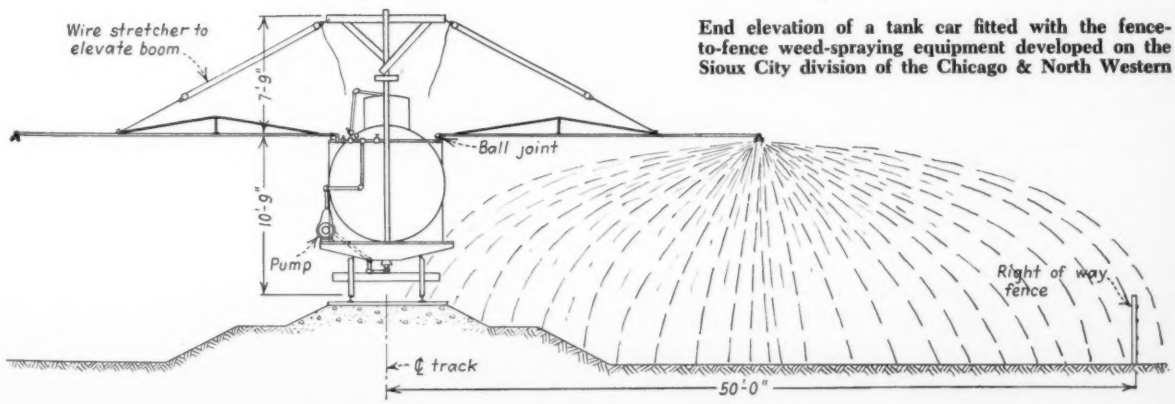
By B. S. CONVERSE
Division Engineer
Chicago & North Western
Sioux City, Iowa

Because of excessive weed conditions prevailing in western Iowa the North Western is spraying its right of way in that locality with a selective weed killer, 2,4-D, with the objective of eventually obtaining a cover of native grasses that will discourage any further growth of objectionable weeds.

• The Chicago & North Western is now in its third season in carrying out a program of chemical weed control in western Iowa, involving the spraying of 2,4-D over the entire right of way (except the track zone), with specially-designed equipment. The objective of the program is to spray the weeds with 2,4-D, a selective weed killer that has no effect on grasses, until the right of way is covered with a good stand of grass, after which, theoretically at least, the chemical treatment can be discontinued on the basis that a good stand of grass will prevent the further growth of objectionable weeds.

Equipment Problems

It is not too difficult or costly to destroy large patches of noxious weeds chemically, but any operation which will destroy single noxious plants scattered throughout the right of way, or control seed production of every plant except grasses, is a different proposition, as it necessarily involves treatment of the entire right of way at considerable expense. However, it was deemed advisable in 1948 to devise some method of chemical spraying that could be performed economically from the track. At that time the selective weed killer, 2,4-D, was fully developed and on the market in large quantities at a reasonable price, and the problem was to devise equipment for spraying this material in such a way that the entire



End elevation of a tank car fitted with the fence-to-fence weed-spraying equipment developed on the Sioux City division of the Chicago & North Western

Above — In mid-August objectionable weeds were flourishing along this section of unsprayed right of way, while . . .

Spray car in operation. Nozzles produce uniform spray patterns over large areas

right of way would be covered with a fine mist of solution in the proper proportion to cause destruction.

Early Work Described

After experimenting unsuccessfully with various types of commercially available nozzles, homemade nozzles were devised by flattening lengths of copper tubing. With these nozzles and a gasoline-powered pump mounted on a tank car, 38.4 mi. of right of way (about 465.4 acres) on the Sioux City division were sprayed in 1948 at cost of $19.63 per mi., including work-train service. The chemical used was Esteron which contains 44 per cent isopropyl ester of 2,4-D. It was mixed with water in the ratio of one pint to 35 gal. The spray car was operated at a speed of 5 m.p.h., which permitted application of the solution at a rate of 30 gal. per acre.

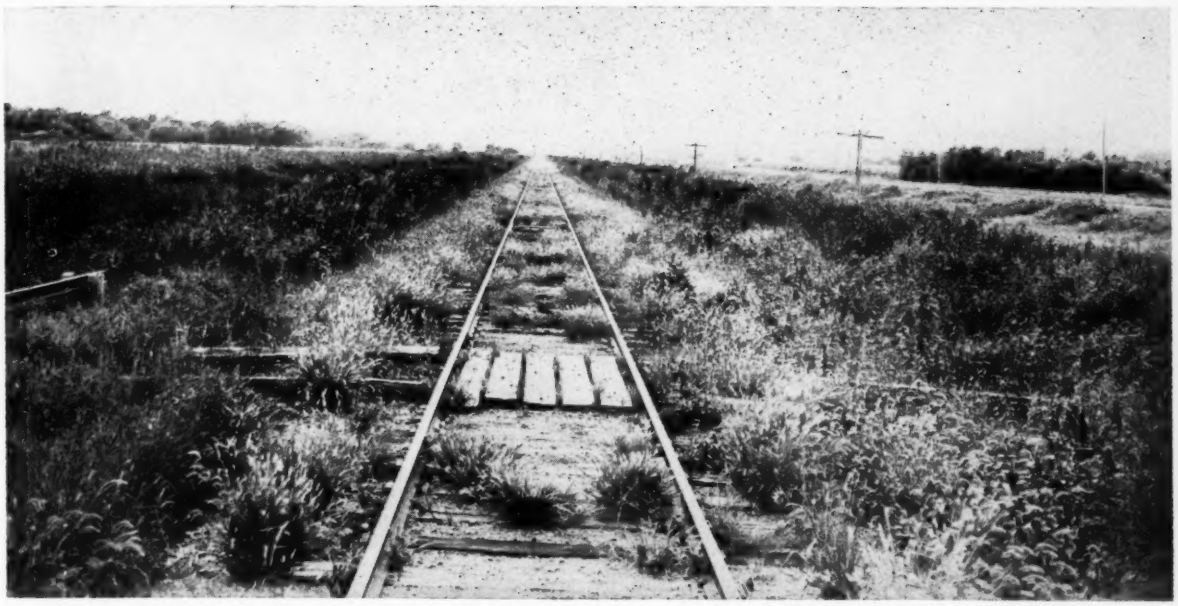
The spraying work with this equipment was a squirting operation much like watering a lawn. However, the spray stream never did reach as far as the right-of-way-fences nor did it provide an even distribution of the chemical.

For the 1949 weed-control operations on the Sioux City division a much more satisfactory spraying arrangement was worked out through use of "Boom Jet" nozzles. This type of nozzle, a recent development, consists of a brass body with a 1¼-in. pipe connection, to which are attached two single swivel nozzles which can be set in any position throughout an arc of 360 deg. The tips of these nozzles contain off-center orifices of a peculiar design which produces a uniform spray pattern over a large area. Nozzles of this type were fitted to the ends of two spray booms, one of which was mounted on each side of a 10,000-gal. tank car.

Spray Boom Described

Each spray boom consisted of a 25-ft. length of 1-in. pipe which, for two-thirds of its length, was stiffened by a simple truss. By means of ball joints the booms were hinged to the running boards of the tank car at a height of 10 ft. 9 in. above the top of rail. These joints permitted the booms to be raised or to be folded back against the sides of the car to clear obstructions. Support of each boom in a horizontal position was accomplished through use of a vertical mast and a wire stretcher extending between the mast and the outer end of the boom truss. This arrangement also permitted the weight of the boom to be handled by one man.

The chemical solution, which was mixed and carried in the tank car, was pumped through the spray



. . . on this section, at the same time, the weeds were beginning to thin out as a result of a prior spraying operation

booms and the nozzles by a 2-in. centrifugal pump mounted along with its power unit—a gasoline engine—on the body bolster of the tank car. Pressure was regulated through use of a pressure gage and a valve in a by-pass line. The by-pass arrangement provided agitation of the solution in the tank as well as pressure control. The most satisfactory results were obtained with a pressure of 45 p.s.i. At this pressure the droplets were larger than at higher pressures and the spray was less subject to drift.

Mileage and Cost

This equipment was used on the Sioux City division in 1949 to spray the entire right of way, except the track zone, over a total distance of 135.7 mi. (about 1513 acres), at a cost of $16.68 per mi., or $1.49 per acre. This distance was sprayed in five days—an average of 27 mi. per day. The crew required for the work, in addition to the train crew for the work train, consisted of two operators who handled the booms, manipulated the pressure valve, serviced the pump, and performed all the work necessary in filling the tank with water and mixing the solution. Supervision was provided by a roadmaster who accompanied the equipment.

The weed-killer solution consisted of one gallon of 44-per cent isopropyl ester of 2,4-D to 187 gal. of water. The spray car was propelled by the work train at a speed of 11 m.p.h., which resulted in a rate of application of 32.36 gal. of solution per acre. This is equivalent to 1.38 pint or 0.578 lb. of active acid per acre.

Drift Presents Problem

Sprays of the size produced by this equipment are subject to considerable drift, and it was found that the spray car could not be operated during weather conditions involving any appreciable amount of wind. Consequently, all spraying operations were started at dawn and continued either until the wind came up, or until the crew had put in eight hours. Drifting of the spray is very objectionable for several reasons. First, severe drifting may result in no contact being made with the right of way whatsoever. Secondly, cross winds may change the spray pattern in such a way that only a part of the right of way would be sprayed. Finally, spray drift into adjacent fields may result in damage to certain broad-leaved crops, such as soy beans or garden vegetables.

No Crops Damaged

Spraying operations on the Sioux City division to date have caused no crop damage, the principal crop being corn. Fields of soy beans, and gardens, were protected by shutting off the spray.

Periodic inspections of the right of way after the 1949 spraying operations indicated that satisfactory results were obtained considering the fact that the equipment was operated late in the season after the weeds had matured and the right of way was covered with a rank growth of perennials. There was some evidence of spottiness which would indicate that sufficient agitation of the solution had not been obtained by the by-pass arrangement. However, a satisfactory reduction in the stand of weeds was obtained and much of the seed produced after spraying was found to be not viable. Furthermore, it was found that the reduction of weed growths had encouraged the spread of native grasses on the right of way, and it is expected that after several years of spraying a cover of grass will be obtained that will discourage further growth of weeds.

In 1949 the weed-spray equipment described above was also used on the Iowa division where about 65 mi. of right of way were sprayed. The program for 1950, insofar as the Sioux City division is concerned, is to spray about 207 mi. of right of way with essentially the same equipment and chemical as was used the previous year. This year the Iowa division will spray about 130 mi. For use on the Iowa and other divisions another spray outfit has been equipped which is similar to that in use on the Sioux City division.

Transport Methods f

Fig. 1 (above)—A method of moving a pair of long rails on crossties. The entire setup skids along track rails

Fig. 3 (below)—Welded rail for the I. C.'s Cairo bridge was moved on skids 8 strings at a time, as shown here

Fig. 2—In the skid-tie method tie plates are first fastened at both ends of each tie to serve as runners on the track rails. The welded rails are then placed on the ties and held by rail anchors

By R. W. TORBERT
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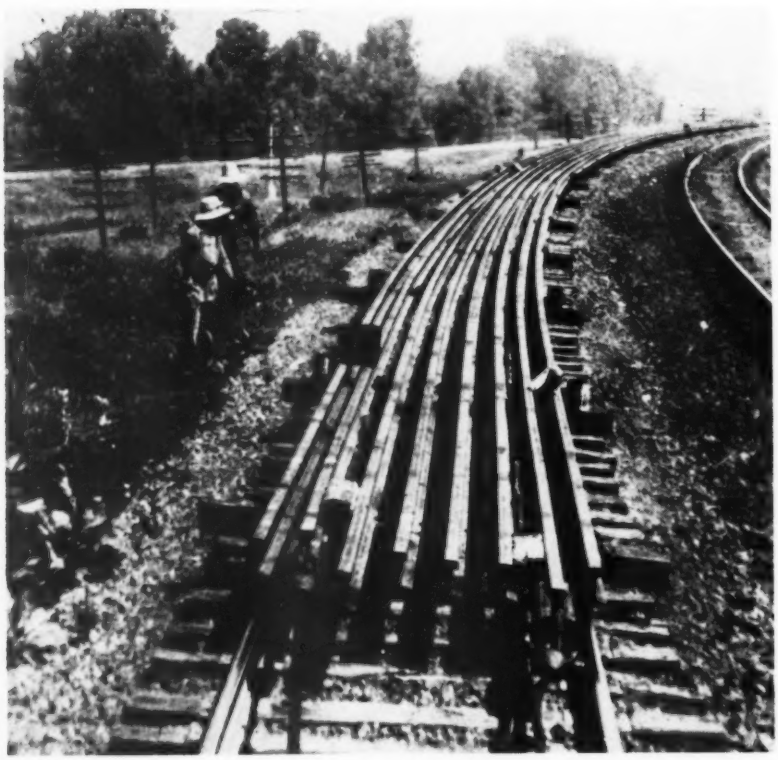


• In view of the steadily increasing use of welded continuous rail—"Ribbonrail"—by a growing number of railroads, it is worthwhile to review the various methods used to transport long rails from the welding site to the track location. A number of different methods have been used. Each method is simple; the choice depends on the railroad, the distance the rail has to be moved and the geography of the area.

The Simplest Method

The simplest method for moving continuous rail is to fasten a chain or wire cable to the end of a long length and drag it to the laying site. This method has been used by many railroads and is being used by the Chicago, South Shore & South Bend in its 1950 continuous-rail program. Use of this method is usually confined to projects where the welding site is relatively close to the location for laying the rail. Depending on circumstances, a drag of a mile or two should be the maximum.

Fig. 1 shows a method for moving a pair of continuous rails on

s for Welded Rail

Fig. 4—By hanging a single long rail under push cars, motor cars instead of heavy equipment can be used as motive power

Fig. 5—In moving welded rails on the tops of push cars, the rails may be loaded onto the cars by using skids, as shown here

A number of different methods have been developed for transporting lengths of welded rail from the production line to the point of installation. The method to be used in a particuar instance, as explained by Mr. Torbert, depends on the distance from the welding site to the point of installation and various other factors.

crossties spaced about 50 ft. apart. The entire setup skids along the track rails. This method was used successfully by the Elgin, Joliet & Eastern in moving continuous rails a distance of four miles.

Here's how this method works: Old single-shoulder tie plates are first fastened at both ends of the ties to be used. The plates are spaced so the distance between shoulders corresponds roughly to the track gage. The ties are placed on the track rails. Each tie acts as a sled, and the plates as runners. The welded rails are then placed on the ties, and held by rail anti-creepers driven on the rails on each side of all skid ties, as shown in Fig. 2.

The E.J.&E. moved 21 pairs of rails, varying from 410 ft. to 1750 ft. in length, by this method The longest haul passed around two curves; one of 2 deg. about 200 ft. in length and the other of just under 2 deg. about 2300 ft. in length. Although the inner rail kinked a little going around the curves, it caused no serious trouble. Several turnout switches were passed over without difficulty. To help the setup slide more easily, oil was placed on the running rails ahead of some of the skids. Later, water was caused to drip on the rails from drums set up on some of the skid ties. No damage was done to the running rail.

Long Rail for Cairo Bridge

The skidding method has been used to haul several lengths of continuous rails simultaneously instead of just two lengths. Continuous rail for the Illinois Central's Cairo bridge was welded into 16 lengths from 487 ft. to 1058 ft. long. Eight of these strings were placed on skid ties similar to those used by the E.J.&E. As shown in Fig. 3, the ends of the strings were even at the hauling end. The skid ties were spaced about 20 ft. apart so that the load on each tie was approximately 4000 lb. At the rear of the load, the ties were spaced about 50 ft. apart since at that end they supported only four or two of the long rails. Anchors were used on each rail on both sides of each skid.

Two moves were made, with eight rails being carried on each move. Both moves were made through yard switches, and then along six miles on the main line to the bridge. The first move was through two No. 10 turnouts and the second through one No. 8 turnouts. On the main line, the rails and ties traveled easily around curves up to 5 deg. On the north bridge approach they traveled up a grade of 0.4 per cent. Friction between the skid plates and the running rails was reduced by oiling the rails from drip pans set up on both ends of four skid ties.

To remove the rail from the skids, the E.J.&E. used a locomotive crane to lift the rails off the skids to the outside of the running rail. The Illinois Central used a different method. As the group of rails was pulled up on the bridge, it was stopped so that the outside rails on each side could be lined off between the running rails and the timber guard rails, directly opposite their final positions on the track. Then the remaining group on the skids was hauled ahead until the next pair of rails was in the correct position for being lined off.

Other Methods of Transport

Dragging and skidding long rails usually requires locomotives, work trains, or other heavy equipment. However, long rails can be moved without using such heavy equipment. Here's how the Peoria & Pekin Union used only push cars and motor cars to move long rails (Fig. 4). This road moved continuous rails, 607 ft. long, on push cars. From the storage rack

at the end of the welding site, the long rails were barred to the center of a running track in position for loading under the push cars. The cars were spaced about 40 ft. apart. Each push car had two crossties placed the length of the deck so that they overhung the ends of the car. The rail was jacked up 6 in. and a U-shaped hanger, with the upper-ends of the legs shaped to fit over the ties, was then slipped under the rail at each end of the car. A strut was then bolted across the upper ends of each hanger.

At each end of a continuous rail string, the rail ends rode on a small four-wheel dolly. Rail anchors fastened to the rail on each side of the rear axles of the dollies held the rail in place. It was a one-mile haul from the welding site to the bridge on which the rail was laid. Head-end power for the haul was provided by a heavy-duty motor car attached directly to the front dolly by a steel draw-bar. A standard section motor car, similarly connected at the rear, was used as a pusher.

In position on the bridge the rail was jacked up to permit removal of the hanger and the rail was lowered so that it rested on 4-in. by 4-in. wood skids about 40 ft. apart. The old rail with the joint bars still in place was barred to the center of the track, suspended under the push cars and removed from the bridge.

Using 15 men, 700 track-feet of 90-lb. rail were moved and laid in a 9-hr. day without interfering with track or bridge traffic. This same method of transporting continuous rails has also been used by a number of other roads.

Another Push-Car Method

Several railroads, including the Chicago & North Western, the Santa Fe, the Illinois Central and the New Orleans Public Belt, have moved continuous rails on the tops of push cars. Usually a pair of rails is moved at one time. The long lengths are placed on the push cars by cranes, or they are pushed down storage skids onto shorter skids attached to the tops of the push cars (Fig. 5).

Fig. 6 shows how the Illinois Central hauled long rails on push cars. The rail had to be hauled for placement in tracks in suburban South Chicago. These rails varied in length up to 600 ft. As they came off the welding line, they were stored on a rack large enough to hold 12 lengths. The racks were located between two tracks so that the push cars could be spotted for loading on one side and a crane could be used on the other side to help skid the rails one at a time on the push cars.

Fig. 6—Showing how the I. C. hauled long rails for placement at South Chicago

The storage rack consisted of bents spaced on 15-ft. centers, each topped with a skid rail. In the loading operation, a push car was spotted as near as possible opposite every third bent, or at 45-ft intervals along the rail. A short skid rail was used between the push cars and each bent. A Burro crane furnished the power to skid the rails onto the push cars. Usually six rail lengths were handled on each trip.

For unloading, one short skid, made out of a short piece of scrap rail, was provided for each push car. About a foot of base and web were cut off at one end, and the ball bent so that it would lie flat on the push-car floor when the skid was placed at a 45-deg. angle. The opposite end was bent on the same angle so that it laid approximately flat on the ballast.

The crane was used for hauling and unloading. A foreman and six men followed on a motor car to watch the load in transit and handle the unloading. In unloading, each rail was spotted at the point where it was to be used. The skids were set up at each car, and the rail to be unloaded was barred over to the extreme edge of the cars throughout its length. Stops at the end of the skids on the cars were removed. Then the crane picked up one end of the rail, swung it out about two feet, and held on until the rest of the rail hit the ground. Usually the rail was unloaded without any barring and in most cases with the ball up.

No particular difficulty was experienced in hauling or unloading. It was found desirable to keep the skids on the push cars greased. Dry skids resulted in the binding of the wheels, with possible danger of derailment. Each operation of loading or unloading required about an hour. In hauling, the speed was limited to about six miles per hour.

Flat Cars Carry Rail 300 Mi.

Flat cars carried continuous rail more than 300 mi. on the Norfolk & Western (Fig. 7). The problem was to move the rails, 1200 ft. long, from the welding site at Roanoke, Va., to Portsmouth, Ohio, where they were to be installed at a passenger station. The welding site at Roanoke operates on a production-line basis. Rails are welded, flame-cleaned, sprayed and loaded on the cars, as a single movement.

Fig. 7—Flat cars carried continuous rail over 300 mi. on the Norfolk & Western

The loading station, at the end of the line, is raised to car-floor height for easy loading.

The cars are prepared by dropping the brake wheels, and blocking the couplers to remove slack. Coupler cut levers are tied down so that the cars cannot be uncoupled accidentally. Wood stakes, about 4 in. by 6 in., placed in the stake sockets, keep the rails from moving laterally. Two short skids are placed across each cars against the stakes.

The rail is loaded on the cars and rests on the skids which provide sufficient friction to keep the rails from moving longitudinally in transit. An extra idler flat car is placed at each end, and the entire welded-rail load is moved together with time freights or empty coal trains to the terminal nearest to the site of installation. The method of unloading is simply to fasten the end of each rail to the track, and then pull the cars out from under it. In most cases, these long rails left the roadway material yard in the afternoon and were at the installation site the next morning.

Rails Loaded in Two Layers

An adaptation of this method was used in the installation of continuous rails in two miles of open track on the Richmond, Fredericksburg & Potomac at Glen Allen, Va., this year. The welding line reached the floor height of 25 flat cars, and ten welded rail strings were loaded on the first layer. Wooden skids, made from 4-in. by 6-in. material, were then placed on top of the rails and a second layer of 10 strings was loaded. Work trains moved the loaded cars to the laying site. The top layer was unloaded for the relay of the outside rail. Then the top skids were removed, and the bottom layer unloaded for the inside rail.

Special Flat Cars

A transportation method that has been quite successful is the use of flat cars that are equipped with specially-constructed rollers. As long rail is produced it moves on rollers from the welding line directly onto the flat cars. In one layer of rail on the cars, 12 parallel strings can be accommodated. The E.J.&E. used 43 flat cars. The Great Northern, in laying four miles of welded rail in its Cascade tunnel, used 25 similar flat cars equipped witth rollers.

The 43 cars used by the E.J.&E. accommodate rail in which there are about 480 welds. Based on an output of 40 welds per 8-hr. day from a single Oxweld pressure-welding outfit, the 43 cars hold 12 days' production. On that basis the work train is used only once every two weeks to move the continuous welded rail to the laying site.

The method of removing continuous rail from the rollers on the flat cars to the ground is quite simple. The Great Northern removed one rail at a time by attachin one end of a cable to a rail and the other to the old rail in track. The string of flat cars was then pulled slowly from underneath the rail. The E.J.&E. uses essentially the same method except that a pair of rails is held immovable by a work crane while the string of flat cars is pulled from beneath the rails. The procedure usually followed in unloading rail is that, after the train has been spotted for the unloading, a clamp is attached to the ends of two rails. The clamp fastened to the crane is held stationary while the flat cars are pulled from underneath the rail. As the trailing ends of the pair of rails leave the last flat car, they slide down a skid consisting of a heavy steel trough. The clamp is then removed and the crane is used to set the rails outside the tracks.

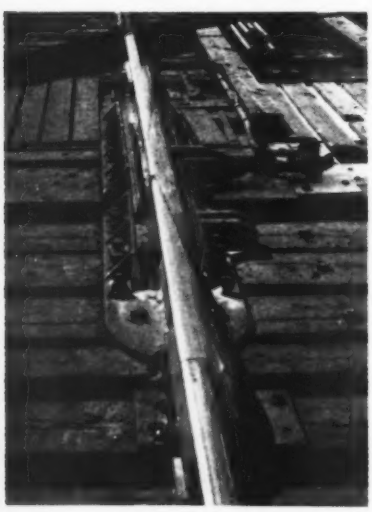
Governing Factors

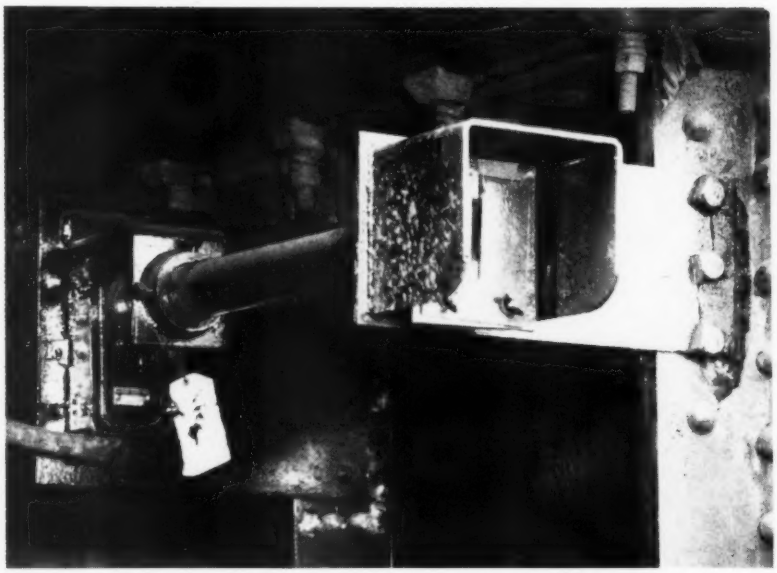
From the methods described, it is clear that transportation for "Ribbonrail" depends on three factors: (1) The lengths of the welded rail; (2) the size of the welding program; (3) and the distance from the welding site to the point of laying. Regarding the last factor, it is notable that most railroads have endeavored to have their welding sites close to the laying site, regardless of the method used to move the continuous rail. The apparent ease, economy, and feasibility of moving large amounts of continuous rail on flat cars would indicate that it may not be necessary or advisable to have the welding site close to the point where the rail is to be laid. It would seem entirely possible on small railroads to have all continuous rail produced at one point and in the case of larger railroads at three or four points. At such central locations, the welding setup could be in semi-permanent buildings so that work could be comfortably and efficiently performed the year around. It need hardly be pointed out that efficiency will be increased and costs lowered if "Ribbonrail" is produced around the calendar.

Bridge Machinery Protected by

Serious damage has resulted to lift-rail assemblies and related machinery by the mishandling of movable bridges on high-speed lines of the Chicago, Milwaukee, St. Paul & Pacific. To safeguard this valuable machinery on the road's swing span bridge over the Menominee river in Milwaukee, Wis., electrical equipment was installed to control each step of the operations involved in opening and closing the span.

Before the raised lift rails and rockers (above) can be lowered for rail traffic (below), the photo-electric relay must be in alinement with light beam





The light source is mounted in back end of this tube fixed to shore span. The light beam is emitted through a ⅜-in. slot at front end of tube and can strike the . . .

• The Chicago, Milwaukee, St. Paul & Pacific maintains a swing span bridge, known as A-316½, to carry its main tracks over the Menominee river at Milwaukee, Wis., which is equipped with manganese lift rails for connecting the running rails on the span with those on the shore. The lift rails are raised and lowered by separate electric motors and machinery located beneath the deck at the ends of the swing span, and are controlled from a push-button panel mounted in the bridge operator's house.

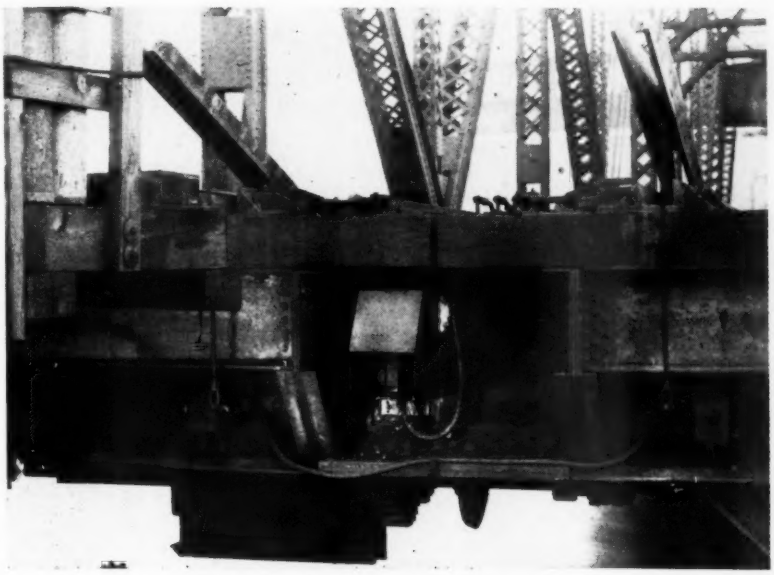
The swing span is a through-truss structure and, because the operator's house is located over the center pier and at one side of the span, the hangers, intermediate posts and diagonals of the near truss prevent the operator from having a clear view to determine if the running rails are in accurate alinement. Hence, to protect the lift-rails and machinery from serious damage through inaccurate bridge alinement, electrical equipment, including a photo-electric relay, was installed, which immobilizes the operation of any but the proper push-button control unless the correct sequence is followed and the span is in true position.

Bridge A-316½ is a double-track bridge consisting of a swing span 203 ft. long and a 46-ft. 8¾-in. deck-girder westerly approach span. The swing span has a long and a short arm and revolves about a vertical axis of the rim-bearing type on a center pier located about 60 ft. from the east end. A lever-operated latch, manually controlled, is located at the end of the long arm and, when the bridge is being closed, the latch drops into a seat in an end casting that is equipped with springs for absorbing the shock and for assisting a manually-operated brake in stopping the movement of the span. The springs allow a lateral deflection of approximately two inches in either direction from the true closed position of the span.

Wind Is Troublesome

While this arrangement permits the approximate lining up of the running rails on the swing span with respect to those on the shore span, an error of one inch from the true alinement could easily result in serious damage to the lift rails and their related machinery if they were forcibly lowered while the span is in this position. A situation

Photo-Electric Relay



. . . photo-electric cell of this relay on swinging span only through another ⅜-in. slotted aperture. Slots must thus be alined before lift rails can be lowered

of this kind is almost a certainty whenever the bridge is opened and closed while a wind is blowing, as the springs are not sufficiently strong to prevail against the weight of the span and a wind load. Furthermore, a misalinement of one inch could not be detected by the bridge operator, even if he left his house to sight along the running rails, because of the fact that the lift arms in a raised position obscure the view.

This problem was overcome by the installation of a General Electric photo-electric device that permits the bridge to be lined up with an accuracy of ⅜ in. by the assistance of visual signals displayed within the operator's houes. This distance of ⅜ in. is sufficiently close to allow the lift rails to be lowered without damage and, while being forcibly seated in their base plates, to pull the swing span into accurate alinement.

Installed in Two Parts

This device is installed in two parts beneath the deck at the end of the long arm of the swing span and of the westerly approach span. The part having the photo-electric relay, shielded by an inner and an outer hood, is mounted on the west-end floorbeam of the swing span. The hoods are so arranged that light can only strike the photo-electric cell of the relay by entering through a vertical ⅜-in. slotted aperture. The part having the light source of this device is mounted within a tube, 2 ft. 7in. long, on the shore span and is directed horizontally toward the swing span through a vertical ⅜-in. slotted aperture at the river end of the tube. When the bridge is in a closed position, the two slotted apertures face each other and are about 1 ft. 10 in. apart, thus requiring close alinement of the parts of the device before the light can energize the photo-cell and make power available for other operations.

Bulb Changed Monthly

Although the service life of the bulb of the light source is said to be 1,000 hr., the bulb is changed out monthly to insure the uninterrupted operation of this unit. Also, in the event that the device should be damaged and made inoperative, a by-pass switch has been inserted in the wiring circuit so that, by closing this switch by hand, power is again made available for operating the bridge machinery.

The electrical circuits are so arranged that they eliminate human error and misjudgment on the part of the bridge operator. When the bridge is to be opened for river traffic, a certain procedure must be followed. The track signals are caused to display a red indication, if not already in this position, and a timing switch assures trains having ample time in which to make a stop in the face of a signal change or to make use of the bridge if they are already within this block. The operator next pushes button switches that activate a traveling-nut limit switch at each end of the bridge and which open four circuit breakers (one for each rail), causing a red indication on the signals to be maintained. The operator then throws a hand lever which opens locks over each one of the eight rocker arms of the lift rails. By push-button control, the operator then energizes the motors of the lifting machinery for raising the rockers and lift rails at the ends of the bridge, raises the bridge latch bar, and then open the bridge for river traffic.

Closing the Bridge

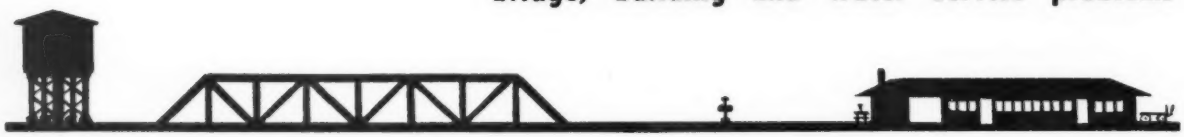
When closing the bridge, the sequence of operations is reversed and the photo-electric relay must be in alinement with the light source before the lift rails and rockers can be lowered. River traffic requires the opening of this bridge from 22 times a week in the early part of the shipping season to as many as 142 times a week in the busy season.

The photo-electric relay and the electrical circuits have now been in service for more than a year and are reported to be rendering safe and dependable service. It is believed that this was the first application made of the photo-electric relay in the controlling of swing bridges.

The design and installation of the electrical equipment was done under the general direction of C. T. Jackson, chief engineer of the road (now retired), assisted by B. J. Ornburn, assistant chief engineer-structures, and L. B. Porter, superintendent telegraph and signals. The design and installation were under the direct supervision of E. E. Burch, bridge engineer, and R. E. Paulson, chief draftsman, assisted by specialists of the General Electric Supply Corporation.

WHAT'S THE ANSWER?

An open forum for maintenance men on track, bridge, building and water service problems



Preventing Culvert Pipe from Disjointing

What is the most effective method of installing culvert pipe under new embankments to keep the pipe from disjointing? What factors contribute to such troubles? Explain.

Check Each Case Thoroughly

By W. B. Roof
Division Engineer, Headquarters Division, Armco Drainage & Metal Products, Inc., Middletown, Ohio

There are basically two reasons why culvert pipe disjoints under either new or old fills. First, lateral forces build up in new fills, which act to spread or elongate the overall length of the culvert. These lateral forces are in addition to the vertical and side pressures which normally build up on underground structures. These forces are built up by gravity or superimposed weight and are generally considered to be about 10 per cent of the maximum vertical loads. In new well-compacted fills built on good foundations, these lateral forces may not exceed 10 per cent of the vertical pressure. However, we have all seen fills in which massive concrete headwalls have been turned over, indicating lateral pressures considerably greater than 10 per cent. These excessive lateral forces can result from one or all of the following conditions: (1) Poor selection of fill materials; (2) poor compaction of new fill material as the fill is built up; (3) widening existing fills without removing vegetation from the slopes, thus causing slippage planes lubricated by surface water; (4) water pockets causing the sides of a fill to saturate and move out under load.

Unstable foundation conditions constitute the second basic reason for culvert pipe disjointing under new fills. Soft foundations will cause settlement of both the fill and the culvert, with the maximum settlement naturally occurring under the point of greatest load or at the location of the weakest spot in the foundation. Even though the culvert structure may maintain its proper cross-sectional shape, it may settle and the joints separate. In this condition the joints have lost their resistance to tension or lateral forces. Culverts of a flexible nature, fabricated in long sections with positive joint connections, are readily adaptable to changing conditions and will continue to maintain resistance to disjointing due to lateral forces.

When foundations under new fills are questionable, there are generally precautions that can be taken to help relieve the possibility of culvert separation and settlement:

(1) Lower the ground-water table with drainage.

(2) Where the foundation is soupy, excavate from 6 in. to 4 ft. deep and about 2 diameters in width and replace with granular material which can act as a foundation under the culvert.

(3) Build a camber into the culvert—the amount of camber dependent on the type of foundation and the height of fill.

(4) Use a continuous type of culvert instead of a sectional type in order to bridge any excessive soft spots, and to assure that the structure will remain intact, if settlement does take place.

(5) Be sure the fill around the culvert is properly placed and compacted. Fill material around and over the culvert should be placed with optimum moisture content.

Answers to the following questions are solicited from readers. They should be addressed to the What's the Answer editor, *Railway Engineering and Maintenance*, 79 W. Monroe St., Chicago 3, and reach him at least 30 days in advance of the issue in which they are to appear. An honorarium will be given for each published answer on the basis of its substance and length. Answers will appear with or without the name and title of the author, as may be requested. The editor will also welcome any questions which you may wish to have discussed.

To Be Answered In the November Issue

(1) What are some of the best methods of keeping turntable pits free of drifting snow? Can switch heaters be adapted to such use? If so, how?

(2) What features of design should be incorporated in moving stairways to adapt them to the modernization of passenger stations? Why? What safety measures are advisable to minimize accidents on moving stairways? Explain.

(3) What is the most effective and economcial method of salvaging crossties, rail and bridge material from abandoned lines? Explain.

(4) Under what conditions is the use of aluminum paint indicated for steel bridges? For other structures? What are its advantages and disadvantages? Explain.

(5) To what extent are electric switch lamps adaptable to use in yards? To main-track outlying switches? What types are available for such use? Explain.

(6) How should grease traps or oil separators be constructed to give the most effective results? How can the size or capacity be determined? Explain.

(7) To what extent is it practical to introduce color in stucco? In monolithic concrete? How is this done? Explain.

This will allow better compaction, which in turn will result in smaller lateral forces.

(6) Provide close inspection by inspectors who know the problems of correct culvert installation and are conscious of the results of poor installation practice.

In cases where no recognition is given to conditions causing high lateral forces and unreasonable settlement, almost any economically-designed structure can be expected to suffer. The types having a high degree of flexibility and fabricated in long sections with positive joints can withstand more of this mistreatment than any other.

Actually, there is no particular mystery in correct culvert installation. Proper installation practice is based on practical experience, adequate foundation investigation, use of good common sense, a desire to do a good job, a willingness to devote enough time to do a thorough job, and the selection of the right type of structure to meet the field conditions.

Composite Decks on Overhead Bridges

What is meant by a composite deck as used on overhead highway bridges? What are its advantages and disadvantages? Under what conditions are such decks advisable? Explain.

Service Tested for 17 Years

By W. D. KEENEY

Engineer, Service Bureau, American Wood Preservers' Association, Chicago

Composite, treated, timber-concrete slabs have been used for decks of highway bridges and docks, and for other heavy-duty floors during the last 17 to 18 years. Each consists of a laminated timber base of 2-in. plank on edge, covered with a concrete mat usually 4 in. to 5 in. thick. The mat and base are rigidly locked together at the junction to convert the assembly into a slab with an effective depth equivalent to the over-all depth of the two materials. Since the neutral axis is at or near the junction plane and the connection between the base and the mat is effective in transmitting shear, the assembly constitutes a beam in which tension is taken by the wood and compression by the concrete. The concrete mat distributes concentrated loads and forms an effective wearing surface.

The timber base is made up of two heights of 2-in. plank, usually 6 in. and 8 in., for spans of 20 ft. to 24 ft. These are laid on edge and spiked together to form a solid laminated slab, the two heights of plank being alternated so that grooves are formed in the top surface of the base.

Plank are usually full-span length. In the case of multiple spans, where a continuous deck is desirable, one-third of the laminations are butt-jointed at the support centers and one-third at or near each quarter-span point. Thus two-thirds of the strips are continuous at these points, and a full timber section extends throughout the midspan section between quarter-span points.

The shear connection is made with shear developers driven into the grooves of the base surface. Trapezoidal in shape, these steel plates are 3/32 in. thick, have a height of 3½ in. and are 3¾ in. wide at the top and ½ in. at the point. They are seated in the grooves so the top protrudes ½ in. above the high laminations to be embedded in the concrete mat. The spacing in a groove depends on the design loads. Adequate seating in the grooves provides three-sided support and adequate end-bearing area on the wood.

The concrete mat is reinforced for temperature and shrinkage stresses to prevent cracking. A usual pattern consists of ⅜-in. or ½-in. bars on 9-in. to 12-in. centers both ways. In continuous spans where negative bending occurs over the supports, sufficient tensile steel is added to take care of calculated stresses—usually a ¾-in. bar about a half-panel length centered over the support between each pair of longitudinal slab bars.

This type of deck has been used frequently for trestle spans up to 24 ft., because 2-in. plank of this length are not difficult to obtain. It has also been used on deck truss and girder spans where stringers are omitted and the slab rests directly on the floor beams

Advantages of the deck are that it requires only small sizes of lumber which are readily available, and erection is simple. Forms, except for curbs, are not required and timber base supports construction loads. The deck is very rigid, continuity reducing midspan moments considerably. Finally the over-all thickness of the slab, which is in most cases about 12 in., uses up less vertical clearance than conventional stringer designs.

Overcomes Shortage of Steel

By J. S. HANCOCK

Bridge Engineer, Detroit, Toledo & Ironton, Dearborn, Mich.

A typical composite deck for highway bridges consists of a solid timber base the full width of the bridge deck, built up of 2-in. by 6-in. plank on edge, alternating with 2-in. by 8-in. plank on edge, with the plank laid continuously and splice joints staggered. These planks are flush on the bottom edge and are spiked together to form a solid, continuous laminated-timber base.

A reinforced concrete slab is then poured on top of this timber base to form a composite wood and concrete deck. The lowest part of the concrete slab is the top edge of the 2-in by 6-in plank. The 2-in. by 8-in. plank project 2 in. up into the concrete to key the wood and concrete together. In addition, the concrete slab is connected to the laminated timber base by metal shear developers to help take care of the horizontal shear between the two materials and, in addition, cause them to act more nearly in unison the full depth of the deck. Also, 60-penny uplift spikes are sometimes driven in each raised lamination with heads raised 1½ in. to 2 in. to assist in tying the wood and concrete together. The width, depth and even the shape of the timber members, above mentioned, as well as the depth of the concrete slab can, of course, be designed to suit varying spans and loads.

About 1919, bamboo rods were substituted for steel reinforcing bars in concrete construction in China. In more recent years, the American Wood Preservers' Asso-

ciation developed the composite wood and concrete deck. In this type of deck, the wood is placed under the concrete rather than inside the concrete and, in addition to acting as tensile reinforcing for the concrete, it acts as formwork to support the concrete slab while it is being poured, as well as to support equipment and materials necessary for the slab construction.

For long-life construction, it is imperative that the timber be well treated. The plank should have as near 100 per cent penetration as possible and should preferably not be cut after treatment.

During times when a plentiful supply of timber and concrete materials are available, and a shortage of reinforcing steel exists, the advantages of this type deck are apparent. The fact that the laminated timber base can be used for falsework and formwork lowers erection costs. The concrete slab will give a quiet, smooth-riding surface and will afford stiffness and rigidity to the deck against horizontal forces, while the laminated timber construction lends a flexibility under loading that should reduce impact stresses.

Highly-skilled help is not required for the construction and all work except the pouring of the concrete slab can be carried on with a minimum of inconvenience during extreme cold weather.

Although comparatively thin concrete slabs, as generally used on a deck of this type, would not be expected to have a long life, especially if subjected to alternate freezing and thawing, bridges constructed in this manner have been in service with minimum maintenance for as long as 30 years in climates varying from the heat of Florida to the cold of Southern Canada. Without such performance one might doubt that the mechanical bonding of the two materials was sufficient to make them act as a unit the full life of the structure. Possibly the major disadvantage is that timber is subject to some warping, twisting and shrinkage and, of course, is not as fireproof as steel or concrete. Considering these facts, I would consider this type of deck advisable at all times when a shortage of steel exists and at any other time when its economy was apparent for the location desired.

Causing Driver Burns on Rails

Are Diesel or steam locomotives more likely to cause driver burns? Why? What are the relative prevalence and character of driver burns caused by these types of locomotives? Explain.

Diesels Haven't Caused Burns

By C. H. SANDBURG
Assistant Bridge Engineer, Atchison, Topeka & Santa Fe, Chicago

The Santa Fe has not experienced any trouble so far from driver burns from Diesel locomotives. In the past, considerable driver burning of rail occurred from steam engines. During this time, observation revealed that big-wheeled engines slipped easier than those with smaller wheels and also that roller bearings on wheels seemed to make slipping easier.

A field check showed that some 2-10-4 locomotives with 74-in. wheels would start slipping when the speed was reduced to about 15 m.p.h. on a grade, whereas some 2-10-2 locomotives with 63-in. drivers would not start slipping until the speed had dropped to about 6 m.p.h. However, some slipping tests made with a steam locomotive showed that rail could not be driver-burned until the forward speed was less than about 2 m.p.h. Therefore, it was concluded that driver burns were caused when starting or when traveling at a very low speed. In some cases it was found that the slipping of wheels when starting was caused by not stopping on sand.

The slipping of Diesel-locomotive wheels is minimized by such automatic devices as load regulators, which govern the speed of application of throttles, wheel-slip indicators or relays that cut the throttles, and automatic sanding when stopping.

Obtaining Non-Skid Surfaces on Ramps

What are some of the more effective ways of obtaining skid-resistant surfaces on masonry ramps used by passengers or employees in station buildings? Explain.

Several Methods Often Used

By L. E. PEYSER
Architect, Southern Pacific, San Francisco, Cal.

Ramps provided for movement of persons between varying levels, unless properly designed and maintained, are a constant hazard. Even if not exposed to weather, the hazard still exists because the footing might be made insecure by water being tracked in or wastes being dropped. Where ramps are exposed, the hazard is greatly increased by water, snow or frost on the surface. By its very nature a ramp does not provide the best footing, and it is therefore desirable to make the surface as skid-resistant as possible.

The slope should be the least practicable that's possible, with 12½ per cent probably being the maximum. If there are changes in direction, the turns should be made at a level platform so that there will be no increase in slope throughout the length of travel and over the full width. If the ramp is very wide it would be well to provide a central hand-rail to assist the infirm.

There are numerous methods of forming an effective non-slip ramp surface. In new construction in which the floor is of concrete, the surface may be roughened by brooming, raking or scoring closely parallel lines, perpendicular to the direction of travel. Care must be taken that roughening is such that irregularity of surface is not so great as to form a possibility of tripping. Brooming or raking have the disavantage of remaining effective over a relative short period.

A better, inexpensive method is to incorporate a metallic admix in the top finishing cement. There are numerous such materials available which remain effective over a great period of time.

Another, but more expensive

and no more effective method, is embedding non-slip ceramic tile in lines or over the entire area of the floor, flush with the surface. A grooved ceramic tile made for this purpose is less effective.

In the case of concrete already in place, the surface may be acid-etched to form a tooth which is quite effective, but is short lived, so that the treatment must be repeated frequently.

A relatively expensive, but very effective and long-lasting treatment, is to grind closely spaced grooves across the width of the ramp and to fill the grooves slightly above the general surface with a non-slip mineral retained in a plastic binder. This treatment is also very effective on marble floors and can be made pleasing in appearance by a well-designed pattern and proper choice of colors.

Where traffic is not too great and appearance is secondary, the application of a non-slip mineral, embedded in a plastic coating applied to strips of fabric and secured by a special cementing medium, is surprisingly effective and lasting. This is also an effective treatment on wood surfaces but cannot be successfully used on any surface which is irregular.

Where traffic is light and appearance is of no importance, an inexpensive treatment consists of the application of a thin coat of heavy-duty asphaltic material, in which is impacted coarse sand or stone chips.

Two Methods Found Effective

By F. E. Austerman

Assistant Chief Engineer, Chicago Union Station Company, Chicago

The Chicago Union Station Company has several types of skid-resistant surfaces on its passenger ramps. The ramps from the east end of the concourse rise 20 ft. to the street level at Adams street on one side and Jackson boulevard on the other. The maximum grade is 11 per cent and the original construction consisted of non-skid tile flooring laid to provide cross corrugations ¼ in. deep and spaced 4 in. apart. After 20 years' service the tile was worn smooth enough to require repairs. Abrasive non-skid cement was applied to narrow channels cut in the tile between the corrugations. This non-skid abrasive has proved very successful and has been applied to steps of the same tile, which have been worn smooth or through to the reinforcing rods.

The passenger ramps between the station-track platforms and the outer concourse rise from 5 ft. to 6 ft. at a 7-per cent gradient. These ramps were installed 25 years ago with a one-inch coating of hydrocarborundum portland cement applied to the concrete. The original concrete is in service and is in excellent condition today.

Using Ready-Mixed Concrete

To what extent is ready-mixed concrete adaptable to railway use? What factors determine whether such concrete should be used? If used, what particular points should be covered in the specifications?

Uniformity Is an Advantage

By Franz M. Misch

General Bridge and Building Supervisor, Southern Pacific, San Francisco, Cal.

A good uniform concrete mix cannot be obtained unless proper methods of design and control are used in its manufacture. Too often we see concrete failures which can definitely be attributed to lack of field control. Too often we see railway concrete placed with proportions measured roughly by eye or aggregates by wheelbarrow loads or shovel count, water by guess or otherwise, and cement, for the good of all, obtained in cubic-foot sacks. Each batch is of different consistency and varies with other batches in ultimate strengths.

Ready-mixed concrete can be obtained from plants equipped with suitable control devices. A designed mix can thus be manufactured with uniform consistency —each batch containing actual known weights of various-sized aggregates and cement as designed, and the required amount of water by volume or weight. Correction can be made for the free water in the aggregates available for cement hydration. Such uniform control is a great inducement to use ready-mix concrete whenever plants are available within economical truck transportation distances.

Actual cost per cubic yard of mixed concrete is often cheaper when delivered by ready-mix trucks than when mixed on the job. The cost of unloading aggregates from cars, loss of aggregates in stock piles, cost of unloading and storing cement and the delivery of water, are all costs that must be included in the cost per yard in job-mixed concrete. These hidden costs are not found in a ready-mixed concrete because the cost per cubic yard delivered to the job is known.

Whenever truck deliveries are not feasible due to lack of access roads or excessive distances from plant to job, ready-mixed concrete cannot be used and it is then necessary to set up temporary plant facilities. With large jobs the plant setup can justify reasonable weight-control measuring devices so that uniform concrete can be obtained. However, it requires a large job to get the actual cost of field-mixed concrete lower than the delivered cost of ready-mixed concrete.

Naturally the cost factor is important and ready-mixed concrete costs vary in different locations. The economical distance for truck transportation varies as to road conditions and to the time element. Fresh-mixed concrete, with water added, must be in place in the forms well before initial set of the cement. Thus when water is mixed at the plant, time is an element. However, with improved transit-mix trucks, water can be added when the truck reaches the job, allowing greater distances with economy being the determining factor.

In ordering ready-mixed concrete for any job, it should be specified that the concrete is to be manufactured in accordance with ASTM Specification C94-477 and the following also given: (1) Cement content in sacks per cubic yard of concrete; (2) designated size, or sizes, of coarse aggregate; (3) maximum allowable water content in gallons per sack of cement;

and (4) slump, or slumps, desired at point of delivery.

Under these specifications, the railway user can be assured of obtaining a uniform concrete mix designed for the particular job. The design of the mix will provide a workable concrete with a known minimum strength and will cover the actual conditions to which the concrete will be exposed.

Whenever a concrete job is not large enough to justify a suitable control plant from which a designed concrete mix can be obtained, the use of ready-mixed concrete should be considered if it can be obtained at reasonable cost. Even if the delivered cost of a ready-mixed concrete appear to be higher than a job mix, this extra cost may mean a uniform and weather-resistant concrete, obtained through suitable design and control in its manufacture.

Use Type That Meets Needs

By Lee H. Corning

Manager Structural and Railways Bureau, Portland Cement Association, Chicago

The question in your "What's the Answer" department about the use of ready-mixed concrete on the railroads seems to imply that there is some difference in job-mixed and readymixed concrete. Basically there is no difference and a high quality product should be insisted upon and can be produced as readily by one method as the other.

An adequate specification and good supervision are always essential. The specification should include such items as the cement factor per cubic yard, size and grading of aggregates, water-cement ratio and air content—if air-entrained concrete is used. In addition, the specification for ready-mixed concrete should include slump at the time of delivery, maximum time of haul, mixing time, speed of drum and method of discharging the concrete.

The American Society for Testing Materials has a standard specification for ready-mixed concrete, C-94, which covers the important features of ready-mixed concrete. The AREA, through its Masonry committee, is preparing a report on ready-mixed concrete which includes suggested specifications.

Whether or not ready-mixed concrete should be used on the railroads depends solely on availability, accessibility of the job to truck delivery and the relative economy compared with job-mixed concrete. On small jobs where the plant setup at the site would constitute a large part of the cost of the concrete and proper control of quality may be neglected, ready-mixed concrete offers special advantages. Many railroads are using ready-mixed concrete and are finding it economical where it is available.

Cavitation—Erosion of Cylinder Liners

To what extent if any, does the corrosivity of cooling water contribute to cavitation-erosion of Diesel cylinder liners? What other factors can be involved? What is the best method of control? Explain.

Caused by Combined Factors

By F. L. LaQue

In charge of Corrosion Engineering Section, Development and Research Division, International Nickel Company, Inc., New York

This topic formed the subject of a paper by Dr. F. N. Speller and the writer, which appeared in the July, 1950, issue of Corrosion under the title "Water-Side Deterioration of Diesel Engine Cylinder Liners".*

In that paper attention was drawn to several observations which supported the conclusion that the water-side deterioration of Diesel-engine cylinders was frequently the result of cavitation-erosion associated with high frequency vibrations of the liners. This sort of attack has the following common characteristics:

(1) The corroded metal has a honeycombed appearance.

(2) The corroded surfaces remain substantially free of corrosion products.

(3) The attack occurs in sharply-defined areas with the boundry between the affected and unaffected metal being very sharp and abrupt, though usually irregular in outline.

(4) The center lines of the areas of greatest attack are charateristically 90 deg. from the center line of the crankshaft. Attack on one side is usually more severe than on the other. Occasionally, there is faint attack of the same nature in the fore and aft quadrants in line with the crankshaft. Frequently, the attack is much deeper towards the bottom—the looser end of the liner and is often absent in the center portion but may appear to a lesser degree near the top.

(5) The location of this particular kind of attack does not seem to be determined to any primary extent by the location of the water inlet and outlet passages, nor by so-called "hot spots". However, there have been instances of cylinder-liner erosion that have been connected with the location of water passages and regions of unusually high velocity and turbulence and which have been eliminated or reduced, by improvements in the water-flow arrangements.

(6) This peculiar attack is not confined to any one design or make of engine. It may appear in only a few engines of a particular type and sometimes in only certain cylinders of one engine.

That high-frequency vibration can cause damage of this sort has been established by the common use of magnetostrictive devices to achieve high-frequency vibrations of immersed test pieces which suffer cavitation-erosion almost identical in appearance to the affected regions of Diesel liners.

There is ample basis for the belief that the mechanism of cavitation-erosion involves a considerable amount of corrosive attack which, as a result of cavitation effects in preventing the formation or accumulation of protective corrosion-product films, enables an instantaneous high rate of corrosion to persist for long periods. The metal thus weakened by corrosion is made more susceptible to damage by the strictly mechanical factors in cavitation erosion.

(Continued on page 858)

*This paper was, in large part, originally presented before the National Association of Corrosion Engineers at St. Louis in April, 1950, and abstracted in the May, 1950, issue of Railway Mechanical and Electrical Engineer—Editor

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Thus this conception of a combination of mechanical and chemical or electrochemical factors provides a double basis for remedial measures. The corrosive factor can be reduced by decreasing the corrosivity of the cooling water. This is done most readily by adjusting the alkalinity to a pH of about 8.5 to 9.5 and adding a substantial amount of chromate as an inhibitor, e.g., 2000 to 5000 p.p.m.

The cavitation effects can be ameliorated by such means as: (1) Raising the cooling-water pressure; (2) raising the cooling-water temperature; (3) eliminating or reducing the vibrations believed to be the source of the cavitation effects.

In many cases careful control of the cooling-water composition will suffice to take care of the problem, but where this is not sufficient, attention must be given to the mechanical features associated with the vibrations believed to be the source of the difficulty.

Corrosivity Very Important

By M. A. Hanson
Engineer of Research, Gulf, Mobile & Ohio, Bloomington, Ill.

Cylinder-design is undoubtedly a factor in cavitation-erosion, since this phenomena has been observed only on liners of single-tube construction and not on liners of double construction, with scavenger ports acting as stays. It is believed that the basic cause of this type of attack is most probably a combination of both corrosion and high-frequency vibration.

In many instances, this type of attack has been controlled on cylinder liners by complete inhibition of the cooling water through carefully maintained chromate concentration together with pH control. In these instances, it would seem that the most important factor was corrosion.

In other instances, the attack has been more difficult to suppress by cooling-water treatment, indicating the mechanical factors might be the more predominant. A similar appearing type of attack can be produced on corrosion resistant materials and even on glass by high-frequency vibration.

Where the mechanical factors seem to dominate, austenitic cast-iron liners seem to give better performance than softer cast-iron liners. By laboratory tests, the harder liner materials give inherently better resistance than softer liner materials. This has also been confirmed in a number of truck type Diesel engines.

Generally, it is believed that corrosivity of the cooling water is the more important factor. This is fortunate since it is usually easier to correct the water treatment than to change engine design or materials of construction.

On railway engines, this type of attack, as well as general cooling-system corrosion, has been quite successfully controlled by treating the cooling water with chromate inhibitors. The recommended dosage is a minimum of 2000 p.p.m. of sodium chromate with the pH value of the water adjusted between 8.5 an 9.5. The nearer the quality of the make-up water is to distilled water, the better. Use of high-hardness water or water containing substantial amounts of salt should be avoided. However, high dosages of sodium chromate will to an extent counteract the effect of salt. Although the amount of corrosion inhibitor consumed in corrosion prevention is relative small, frequently substantial amounts are lost through leakage of cooling water. Therefore, a definite method of control of corrosion-inhibitor concentration is required in order to maintain the desired concentration. With the proper alkaline-chromate balance in the corrosion inhibitor, the pH value will fall in the proper range if the desired chromate concentration is maintained in the cooling water.

In road service, daily testing of each unit is desirable. In switch service, weekly testing is usually sufficient. The tests for chromate concentration can be made by non-technical help, either by use of an electrical resistance meter calibrated in terms of concentration or by a specially developed spot test. The spot test consists of a chemically-impregnated blotter on which is placed one drop of the cooling water to be tested. The color is compared with a permanent color standard calibrated in terms of chromate concentration.

Using Electric Fences on Railways

To what extent are electric fences adaptable to railway use on their rights of way? What problems are involved in their use? Explain.

Have Too Many Disadvantages

By A. R. Jones
Division Engineer, New York Central System, Albany, N. Y.

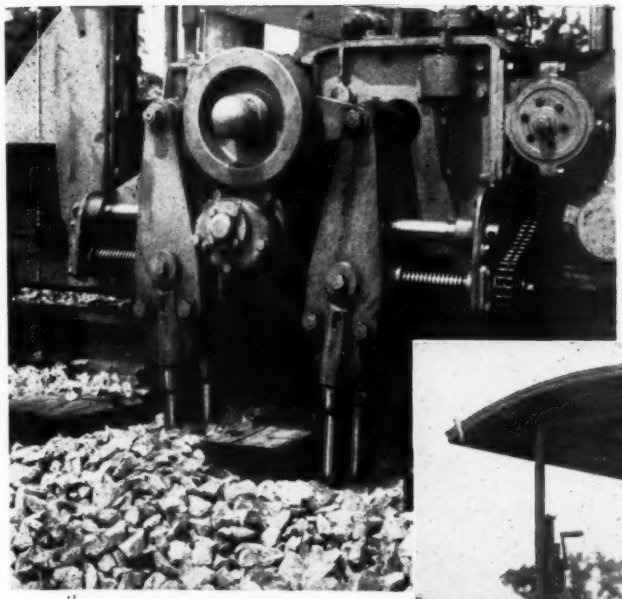
In the November, 1941, issue of Agricultural Engineering, Charles F. Dalziel and James R. Burch published the findings of their experiments on electric fence. They concluded that: (1) It is impossible to design an electric fence controller that will be safe for all individuals; (2) the non-interrupted, a-c, electric fence with a current limitation of 8 m.a. is believed dangerous; (3) the non-interrupted, d-c. fence with a current limitation of 15 m.a. is believed reasonably safe; (4) the intermittent types of electric-fence controllers as approved in present regulations, although possibly safe electrically, should be considered inhumane; (5) the single-impulse electric fence controller is believed to be a satisfactory and reasonably safe solution of the electric fencing problem; and (6) the shock hazard from the charge on the average 10 to 15-mi. electric-fence wire is believed small.

On page 569 of Volume 42 of the Proceedings of the American Railway Engineering Association appears a subcommittee report dealing with this subject. At that time the subcommittee did not consider electric fences suitable for general use on rights-of-way. One of the main objections to such use is the expense of keeping them free of brush and weeds. It has also been found that in dry weather the electric fence is not always effective in confining stock.

There is also the possibility of involving two different crafts in the maintenance of electric fence, namely, the roadway forces for the structural work and the shopcraft or electrical forces for the electrical work.

Finally it would also appear that there may be cases where railroads might be subject to claims due to alleged injury from electric shock.

These MATISA machines



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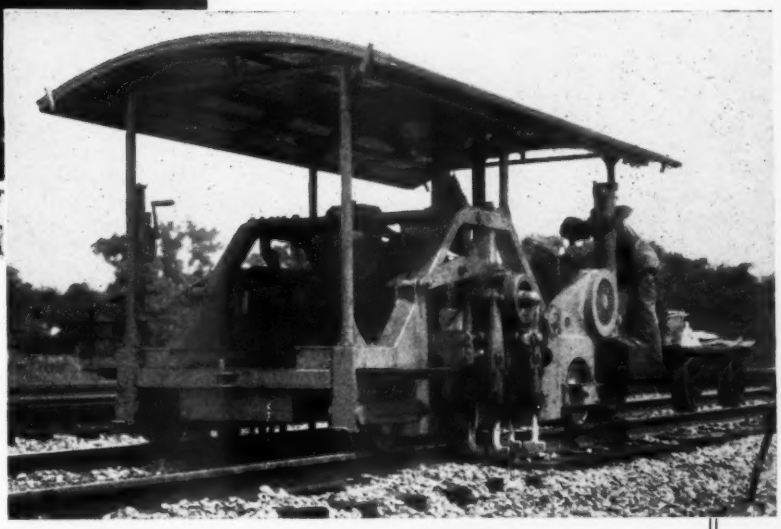

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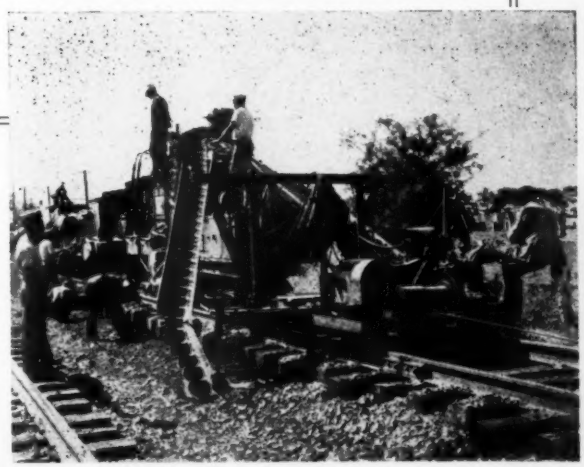

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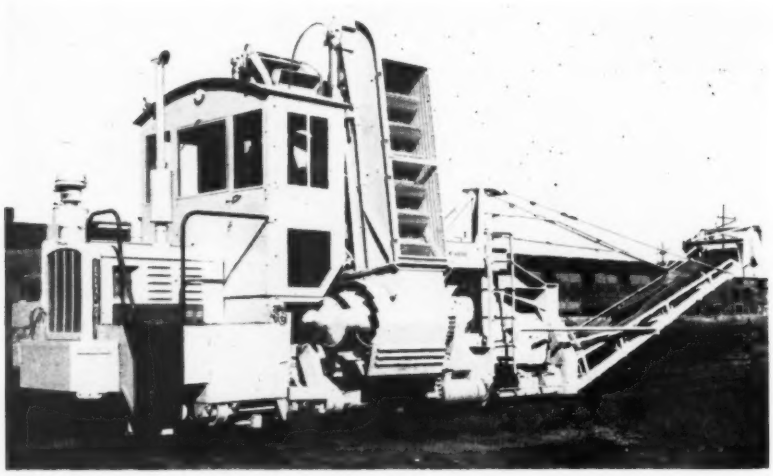


The latest model of the Pullman-Standard ballast cleaner, which has a ballast-cleaning capacity of 800 to 1,000 ft. of track an hour

PULLMAN-STANDARD BALLAST CLEANER

THE Power Ballaster Division of the Pullman-Standard Car Manufacturing Company, Chicago, has announced that, as a result of a number of design improvements, its ballast cleaner is now capable of cleaning ballast at a rate ranging from 800 ft. to 1,000 ft. of track an hour. This machine is a self-contained, self-propelled unit which cleans ballast on both sides of the track simultaneously without fouling adjacent tracks. The greater production has been made possible by changes in the ballast pick-up system and in the method of propulsion.

Ballast pick-up has been impoved by the addition of an auger which rotates in advance of each ballast cutter drum. As it rotates the auger loosens the fouled ballast and feeds it back to the cutter drum, which further breaks up the fouled ballast with its serrated forward edge and then delivers the ballast to the elevator buckets.

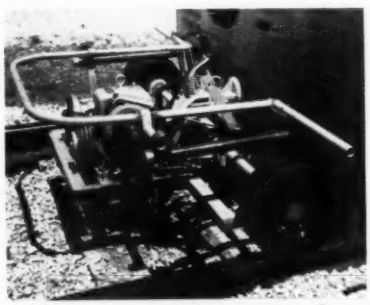
The new method of propulsion of the ballast cleaner is entirely independent of the wheels of the machine and provides a propulsion force considerably greater than that which could be provided by tractive effort exerted through the wheels, considering that the machine is light enough to be removed from the track.

POWER PUSHER FOR MULTIPLE TAMPER

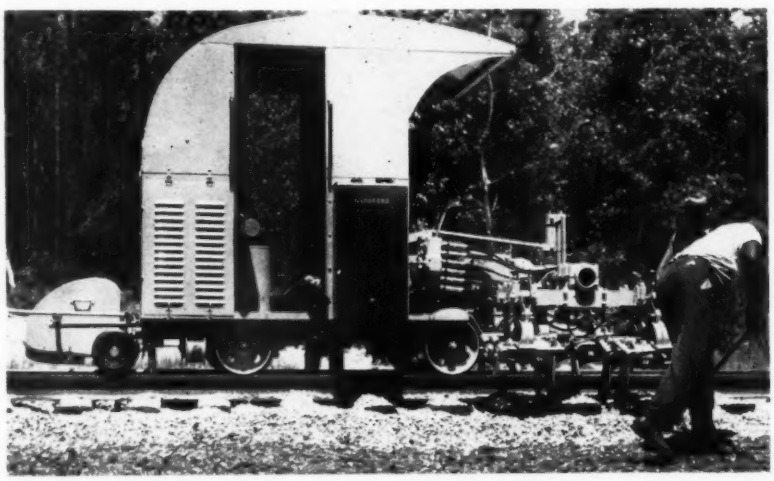
THE Electric Tamper & Equipment Co., Ludington, Mich., has developed a power pusher for the Jackson Multiple Tamper, which relieves the operator of this tamping machine of all manual effort in moving from tie to tie during tamping operations. The device is reported to be particularly useful when working on steep grades, around sharp curves or in the face of strong head winds.

The pusher consists essentially

(Continued on page 862)



Closeup view of the power pusher



The 1950 Jackson Multiple Tamper equipped with a power-pusher

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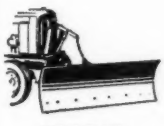
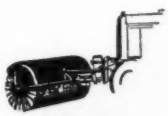

SNOW PLOW


TIE TAMPING


PNEUMAJACK

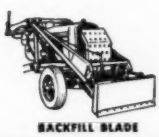

FRONT END LOADER


FRONT WINCH


ROTARY BRUSH


POST HOLE DIGGER


REAR WINCH


BACKFILL BLADE

SEE both the *Pneumatractor*, and Schramm's crawler-welder at

BOOTHS 6 & 7 Bridge and Building-Track Supply Show, Coliseum, Chicago.

Everybody Welcome!

BESIDES spot and out-of-face tamping, there are a host of jobs on the railroad for compressed air—provided you can get the air to the job! And that's where the self-propelled *Pneumatractor* shines. Because the *Pneumatractor* reaches any spot on or off the track with ease. Its powerful motor and big tires take it anywhere.

But the *Pneumatractor* is more than a compressor. It is also a tractor, ready for any towing job such as mowing along the right of way. And there are auxiliary attachments like those shown at the left that give you many plus uses such as back-filling, snow plowing, etc.

The *Pneumatractor's* unique power plant has both motor and compressor components mounted in the same block for compactness and simplicity. Two capacities are available—60 and 105 cubic feet per minute, actual air. The Pneumastat control, giving fuel savings as much as 50 per cent, is standard on the 105, optional on the sixty.

We are sure you'd like to know more about the *Pneumatractor*, and complete details are found in our Bulletin NEU-50B. Write Schramm's Railway Sales Department today for your copy.

SCHRAMM INC.

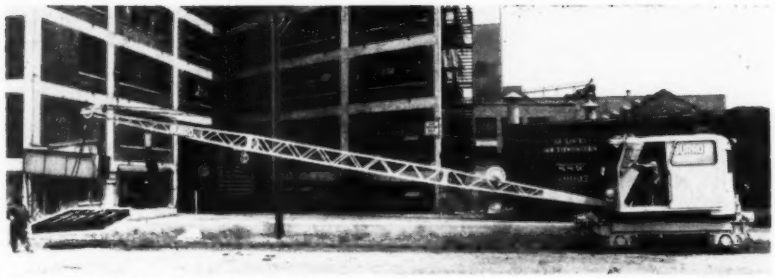
The Compressor People

WEST CHESTER • PENNSYLVANIA

For additional information on any of the products described on this page, use postcards, page 807.

of two retractable, rubber-tired, dual wheels with an axle between them, chain-driven by an electric motor which receives its power from the Multiple Tamper generator. The pusher assembly is coupled closely behind the tamping machine and is controlled by the operator through a hand lever located close to the control valve which raises and lowers the tamping blades. When the operator moves this lever the two wheels of the pusher drop down to engage the rails and thus provide pushing effort. An operator can learn quickly how long to keep the wheels down in moving from tie to tie.

The device can be quickly disengaged from the tamping machine and lifted from the track by three or four men. It can then be as quickly re-attached. If it is necessary for any reason to use the manually-operated hand wheel for moving from tie to tie, the power pusher in no way interferes with it. The device may be applied to any Multiple Tamper now in the field as well as to the latest model.



Equipped with a long boom, the latest Burro crane can be used effectively for laying 78-ft. rails

BURRO CRANE WITH LONG BOOM

THE Cullen-Friestedt Company, Chicago, has added a new unit—the Model 40—to its line of Burro cranes. The new model has a capacity of 12 tons and can be equipped with a 55-ft or 60-ft. boom. Hence, it is reported to be particularly applicable for laying 78-ft. rails and for other work requiring a long reach.

BALLASTMASTER IMPROVED

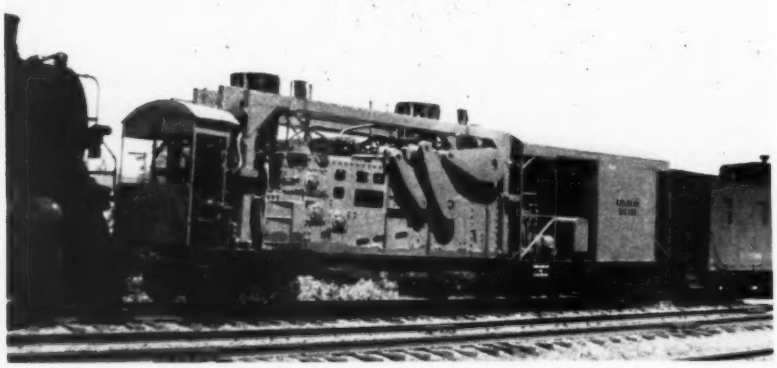
THE Chattanooga Welding & Machine Co., Chattanooga, Tenn., has announced a number of improvements in the Ballastmaster*—a heavy-duty, locomotive-propelled ballast-cleaning machine said to be capable of cleaning a path of ballast 4 ft. wide on both sides of the track simultaneously at a speed of a mile an hour. Basically, the improvements are designed to increase the quality of cleaning without sacrifice of speed.

Toward this end the screening mechanism has been revamped. This mechanism now consists of a framework covered with a special screen cloth designed to remove the wet, sticky material often encountered in ballast cleaning. The forward end of the framework is supported by rubber mountings and the rear-end by bearings about an eccentric shaft.

Improvements have also been incorporated in the chain and rakes of the rake-type drag conveyor. This conveyor propells the foul ballast backward over the screen and, at the same time, agitates the ballast to loosen mud sticking to it. Still other changes have been made in the hydraulic system to decrease operator fatigue, and in the dirt-discharge system to eliminate belt troubles and dirt spillage.

The original model of the Ballastmaster was driven by steam. All future machines, however will be Diesel-electric driven.

Right—When in operation the cleaning boxes are lowered as shown here to scoop up the fouled ballast as the machine is pushed along



The improved Ballastmaster with cleaning boxes resting on frame of car

* A complete description of this machine was presented in the February, 1950 issue, page 142.

EARTH DRILL

THE McCulloch Motors Corporation, Los Angeles, Cal., has announced a portable, two-man, 5-hp., gasoline-powered post-hole digger reported to be capable of drilling at a high rate of speed in any type of earth or clay. The engine of the drill is the same unit that is used for the standard McCulloch chain saw. Consequently, the drill can be quickly converted into a chain saw merely by detaching the drill assembly and attaching a chain-saw assembly.

The weight of the earth drill, complete with a 6-in. auger, is 79 lb. A full-swivel coupling at the engine permits the auger to drill

(Continued on page 864)

REPORTS LIKE THESE TELL THE STORY

Of long valuable experience in a highly specialized business

June 30th, 1950

"Your weed spraying outfit in charge of Harold Sjoblom has just completed the spraying of our terminals. I want to express my appreciation for the fine job you did for us. We got coverage with practically no waste of chemical. In my opinion this is the best coverage we have ever had and it also appears to be the best killing that we have had since I have taken over this terminal."

"I thought you would like to have this information about the excellent work of your employees, and the satisfactory results obtained from your material."

"Your outfit has just completed the spraying of 100 miles of our double main line track and also our yards."

August 5th, 1950

"The results obtained from this spraying are excellent. In addition I wish to advise that the best possible results were obtained because of the excellent co-operation of your operators. No delay was experienced as a result of not being ready to spray, and furthermore, your equipment was in unusually good condition."

Complete organization, with men of experience at every point, chemists who have made a life study of weed killers, plant capacity to take care of peak seasonal demand, at numerous railroad centers, all combine to assure the best results and service in weed and brush control.

If results in your weed control work leave something to be desired, it involves no obligation to review your present procedure with us and to consider our suggestions for an improved money-saving program.

READE MANUFACTURING COMPANY, INC.

Executive Headquarters
135 Hoboken Avenue
Jersey City 2, N. J.

Service Headquarters
9500 Cottage Grove Avenue
Chicago 28, Illinois

PLANTS IN NUMEROUS RAILROAD CENTERS

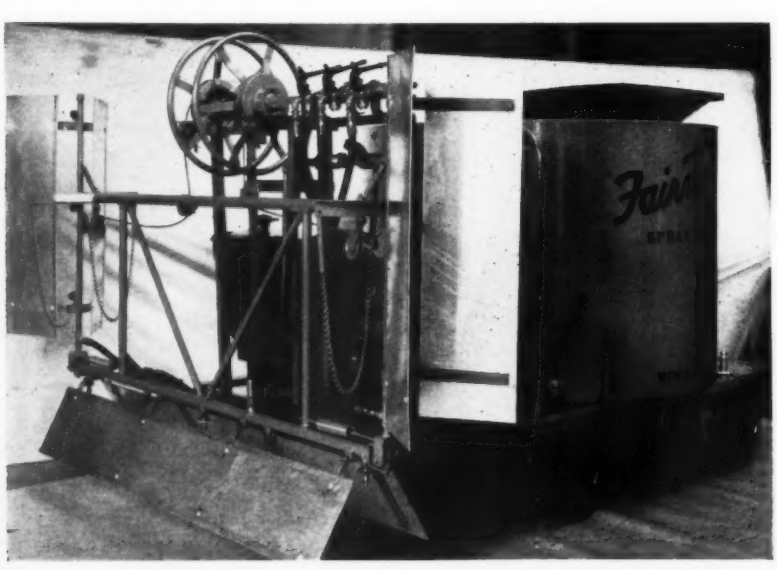
For additional information on any of the products described on these pages, use postcards, page 807.

Above—Drilling a post hole with the new McCulloch earth drill

at any desired angle. The rotation of the auger can be reversed if necessary. Other features of the unit include a centrifugal clutch that automatically disengages the auger at idling speeds, a kickproof automatic-rewind starter, and a diaphragm carburetor that permits full-power engine operation in any position.

FAIRMONT SPRAY CAR

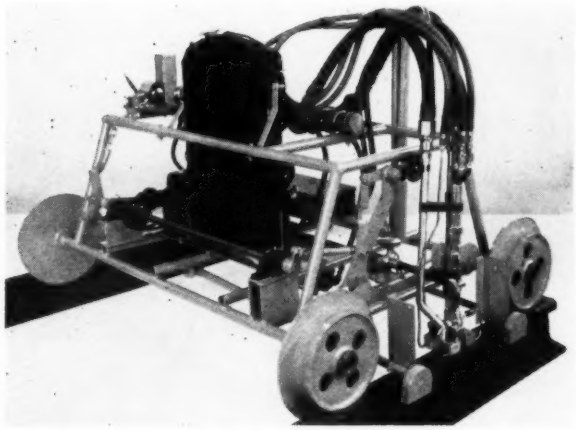
FAIRMONT Railway Motors Inc., Fairmont, Minn., is introducing a new spray car, known as the W78 Series A. The car consists of an 800-gal. tank mounted on a frame with four flanged wheels, a gasoline engine-pump unit, five spray nozzles fed from a horizontal pipe extending across the track, two spray wings, each with three nozzles, and the necessary piping valves and gages. The unit is pushed by a motor car when in operation. The maximum spray width is 16 ft. Each nozzle delivers 3.1 g.p.m. at a pressure of 50 lb. The spray wings are hinged horizontally within limits and are raised and lowered by hand wheels with rachet locks.



Below—The Fairmont W78 Series A spray car

MACHINE FOR HARDENING RAIL ENDS

AIR Reduction, New York, has developed a machine designed for uniformly hardening rail ends. It consists of a vertical heating torch with water-cooled tip, two air-quench tips, and control and actuating mechanisms, all mounted



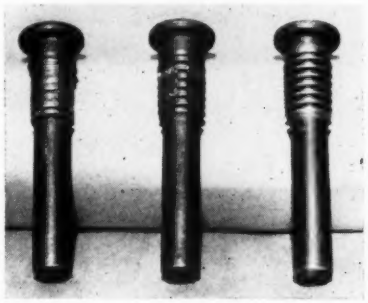
Right—The Airco rail-end hardening machine

on a lightweight frame with four flanged wheels. When in operation clamps, actuated by air pistons, secure the machine to the rails in proper position, and air motors and other air pistons actuate the mechanisms of the various mechanical operations.

During the heating period the torch is oscillated parallel to the track to heat adjacent rail ends simultaneously, and to provide suitable heat patterns. Upon completion of the heating cycle, which is timed, the torch is shut off and uniform quenching is provided by the air-quench tips. The rail hardness resulting from this operation is reported to be within the range recommended by the American Railway Engineering Association.

TIE-PLATE ANCHOR STUDS

THE Ramapo Ajax division of the American Brake Shoe Company, Chicago, has developed a tie-plate hold-down fastening designed to reduce mechanical wear of ties and to aid in maintaining gage. The device is a flat-headed stud, circular in cross section, with a series of ridged rings at the throat. When the stud is driven through a standard 11/16-in. square anchor-spike hole in a tie plate, the rings are deformed, causing the stud to fit very tightly in the tie-plate hole. As a result the tie plate and the stud are said to become, in effect, an integral unit which provides strong resistance to tie-plate movement relative to the tie. The Racor stud may be driven and removed with standard track tools.



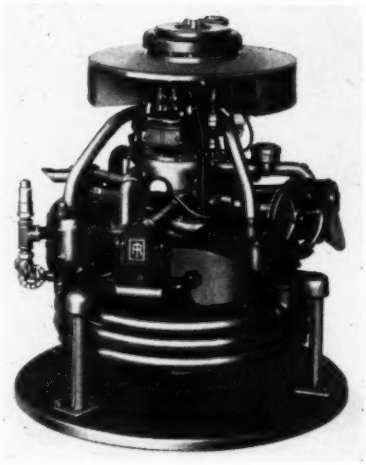
The Racor tie-plate anchor stud. The deformation of the rings when the stud is driven into a square hole in a tie plate causes the stud to fit very tightly in the tie-plate hole

SPOT-AIR COMPRESSOR

THE Ingersoll-Rand Company, New York, has introduced a new Spot-Air compressor, with a capacity of 36 c.f.m., which will operate four Ingersoll-Rand MT-4 tie tampers. Known as the 3R-36, the unit weighs 265 lb. and stands 32 in. high on a 27-in. diameter base plate. Like the first Spot-Air compressor, the 3R-30, which was introduced in 1947, the 3R-36 is equipped with a special wheelbarrow mounting which enables one man to take the compressor and air tools almost anywhere.

The Spot-Air compressor incorporates a horizontal arrangement of three power cylinders and three air cylinders spaced alternately at 60-deg. intervals around a vertical single-throw crankshaft which gives a smooth conversion of en-

(Continued on page 866)



The new 3R-36 Spot-Air compressor will operate four tie-tamping guns

gine power into air power without the need of a heavy flywheel. The fuel tank has sufficient capacity for 2 to 2½ hrs. of continuous operation.

IMPROVED SWITCH STAND

THE American Brake Shoe Company, Ramapo Ajax Division, Chicago, has made a number of improvements in its Racor Style No. 22 automatic switch stand. The lever rests are now cast integrally with the base castings, which are made of malleable iron. This has

The improved Racor Style No. 22 automatic switch stand

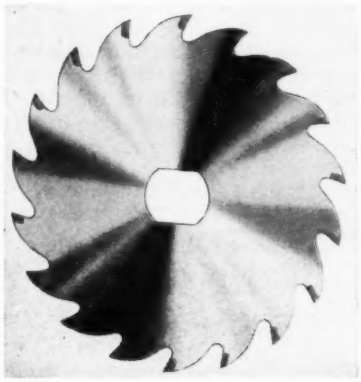
eliminated the two separate forged lever rests provided in previous models. If padlocking of the hand lever is necessary, separate padlock pedestals can be furnished for application over the integral lever rests.

Furthermore, the linkage parts are now heat treated and the roller

has been exchanged for a sliding block made of metal with self-lubricating properties. This change has provided a greater bearing area in the spindle slot and decreased friction between the operating parts.

CARBIDE-TIPPED SAW BLADES

THE Black & Decker Manufacturing Co., Towson, Md., has developed a carbide-tipped blade for its line of "Quick-Saw" portable electric saws. The new blade is reported to cut much faster than abrasive discs when sawing Transite, Cemesto Board, Masonite,



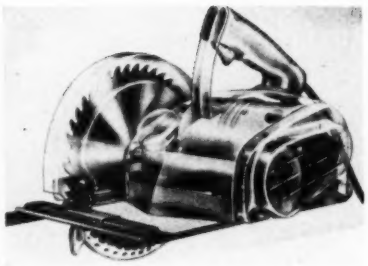
The Black & Decker carbide-tipped blades for "Quick-Saw" portable electric saws

Formica, and other abrasive or plastic composition materials. The blade is also well adapted for cutting wood and is said to make a smoother cut than standard steel blades because of a special tooth design. Furthermore, according to the manufacturer, the carbide-tipped blade stays sharp 30 times longer than standard blades and loses less diameter in the resharpening process. The blades are available in 3 sizes: 7 in. (18 teeth), 8 in. (20 teeth) and 9 in. (22 teeth). They are designed to fit all recent model Black & Decker Quick-Saws.

SYNTRON ELECTRIC SAW

A NEW Type of portable electric saw featuring a dual rubber V-belt drive from the motor shaft to the saw-arbor shaft has been announced by the Syntron Company,

(Continued on page 868)



The Syntron belt-driven electric saw

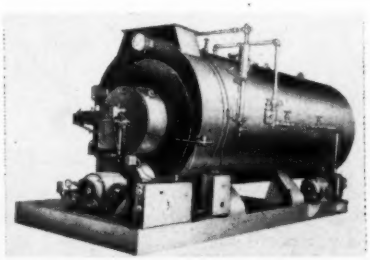
Homer City, Pa. This type of drive eliminates the need for gears and gear boxes and is reported entirely to cushion the motor against sudden shock or overload. Another design feature of the saw is the use of metal stampings instead of metal castings.

The saw is driven by a 1½-hp. universal motor, is fitted with an 8½-in. blade, has a maximum cutting capacity of 2 11/16 in., and weighs 19 lbs. It is equipped with an adjustable base for making bevel cuts from 90 deg. to 45 deg.

PACKAGE-TYPE STEAM GENERATOR

THE Cyclotherm Corporation, Oswego, N. Y., has added a new model—the No. C300—to its line of automatic package-type steam generators. The unit is available in capacities from 15 p.s.i. to 200 p.s.i., and may be fired with light oil, heavy oil, gas, or a combination of oil and gas. Its entire boiler surface is insulated with fibre glass.

When delivered the unit is ready for operation, being fully equipped with an integral Cyclotherm burner, automatic safety and operating controls, steam trim, and valves. The only connections needed are those for water, steam, fuel and electricity. No stack is required. A simple flue vent to conduct exhaust gases outside the building is sufficient.



The Cyclotherm Model C300 steam generator

THE MONTH'S NEWS

Railway Personnel

General

S. A. Anderson, roadmaster on the Northern Pacific, at Glendive, Mont., has been promoted to trainmaster, with headquarters at Jamestown, N.D.

Clarence H. Holzworth, superintendent of employment in the personnel department of the Baltimore & Ohio, and formerly assistant to chief engineer on this road, has been appointed manager, personnel, at Baltimore, Md.

Engineering

Richard Webb, resident engineer of the Norfolk & Western, at Columbus, Ohio, retired on May 16.

A. V. Hooks has been appointed assistant engineer maintenance of way, Southern division, of the Atlantic Coast Line, with headquarters at Jacksonville, Fla.

J. C. Scholtz has been appointed clearance engineer of the Erie, with headquarters at Cleveland, Ohio, succeeding **C. D. Horton,** who has retired after 38 years of service.

J. H. Megee, supervisor of track on the Illinois Central, with headquarters at East St. Louis, Ill., has been appointed assistant to division engineer, with headquarters at Chicago. He succeeds **F. G. Walter,** who has retired.

Robert A. M. Deal, whose promotion to division engineer on the Southern with headquarters at Charleston, S.C., was noted in the August issue, was born in Cabarrus County, N. C., on May 6, 1898. He was appointed assistant engineer in the office of the chief engineer, maintenance of way and structures, at Charlotte, N. C., in March 1926. He became bridge and building supervisor on the Richmond division in March, 1938, and was tranferred to Greenville on April 16, 1949.

W. C. Whitham, assistant division engineer of the Terre Haute division of the Chicago, Milwaukee, St. Paul & Pacific, with headquarters at Terre Haute, Ind., has been promoted to division engineer, with the same headquarters. He succeeds **H. C. Minteer,** who has been transferred to the Milwaukee division, with headquarters at Milwaukee, Wis., succeeding **I. C. Brewer,** who has been appointed division engineer of the Milwaukee Terminal and Madison divisions, with headquarters at Milwaukee. Mr. Brewer succeeds **F. M. Sloane,** who has retired after 44 years of service. **R. J. Middleton,** consulting engineer, and formerly chief engineer of the Milwaukee, has also retired.

William B. Jackson, recently appointed division engineer on the Cochrane division of the Canadian National, as noted

(Continued on page 870)

in the August issue, was born at Vancouver, B.C., on September 11, 1920, and received his higher education at the University of British Columbia and the University of Alberta. He graduated from the latter in May, 1945, with a Bachelor of Science degree in civil engineering. During vacations he worked as chainman, rodman and instrumentman with the Northern Alberta Railways, at Edmonton, Ala. He began service with the Canadian National in October, 1945, as instrumentman on the St. Lawrence division at Montreal, Que. In August, 1946, he was promoted to assistant engineer at Montreal, transferring to the Laurentian division at Quebec, Que., in April, 1948. Mr. Jackson was appointed assistant division engineer of the Levis division in July, 1948.

W. G. Powrie, whose promotion to chief engineer of the Chicago, Milwaukee, St. Paul & Pacific, with headquarters at Chicago, was reported in the August issue, was born at Milwaukee, Wis., on August 5, 1904, and entered railroad service in 1920 with the Milwaukee, serving for three months. In 1923, he returned to the Milwaukee as a chainman serving subsequently as rodman, instrumentman, assistant engineer, assistant to general supervisor

W. G. Powrie

of bridges and buildings, and division engineer. In August, 1932, he was appointed assistant engineer of water service, serving also as assistant superintendent of track maintenance from 1937 to 1941. Mr. Powrie was appointed engineer maintenance of way in May, 1941, and assistant chief engineer in January, 1950.

H. B. Christianson, whose promotion to assistant chief engineer of the Chicago, Milwaukee & Pacific, with headquarters at Chicago, was reported in the August issue, was born in Minneapolis, Minn., September 24, 1892. He received his engineering education from the University of Minnesota, graduating in 1915, and entered railroad service in the land department of the Northern Pacific in

H. B. Christianson

the same year. The following year he joined the valuation department of the Soo Line. Since March, 1917, Mr. Christianson has been in continuous service with the Milwaukee, except for army service in both World Wars. He served as draftsman, instrumentman, assistant engineer, division engineer, assistant to chief engineer, and principal assistant engineer. During World War II, Mr. Christianson served for 33 months as lieutenant-colonel and colonel, U.S. Army Corps of Engineers, in the Southwest Pacific theatre.

C. T. Jackson, whose retirement as chief engineer of the Chicago, Milwaukee, St. Paul & Pacific, with headquarters at Chicago, was reported in the August issue, was born on July 13, 1881, at Miami, Mo., and received his engineering education at the University of Missouri, from which he graduated in 1903. He entered the service of the Milwaukee upon graduation and his experience has covered location, construction and maintenance work. Previous to becoming chief engineer, Mr. Jackson served successively as assistant engineer, resident engineer, locating engineer, district engineer, assistant engineer maintenance of way, assistant to chief engineer, and assistant chief engineer.

John S. Parsons, whose appointment as assistant chief engineer maintenance of way of the Erie, at Cleveland, Ohio, was announced in the June issue, was born at Mt. Jewett, Pa., on March 5, 1902, and received his engineering education from Cornell University, graduating in 1925. He began service with the Erie in April, 1926, as a transitman at Meadville, Pa. In April, 1928, he was appointed chief of alinement corps at Meadville and, later, at Salamanca, N. Y. In December, 1931, he was advanced to general foreman of track at Hornell, N. Y. Mr. Parsons became assistant division engineer at Salamanca in April, 1934, transferring to Buffalo, N. Y. in June, 1936, and to Huntington, Ind., in June 1938. He was promoted to division engineer at Huntington in October 1939. During the period from April, 1941, to September, 1945, Mr. Parsons was furloughed to serve as superintendent and director of transportation and materials handling at the Ravenna Ordnance Plant, Apco, Ohio. Upon his return to the Erie, he was appointed division engineer at Marion, Ohio, which position he held at the time of his recent promotion.

George F. Nigh, whose promotion to assistant division engineer on the New York, Chicago & St. Louis, with headquarters at Frankfort, Ind., was noted in the July issue, was born on January 23, 1912, at Dunkirk, N. Y. He received a B.S. degree in civil engineering from Ohio State university in June, 1935, and began his railroad career with the Nickel Plate as an instrumentman at Dunkirk on October 14, 1940. He was transferred to Conneaut, Ohio four months later, and on December 1, 1943, he was appointed assistant engineer there. Mr. Nigh was advanced to first assistant engineer on January 15, 1947, and served in that capacity until his recent promoto assistant engineer.

Stephen James Owens, whose promotion to division engineer on the Chicago, Burlington & Quincy, with headquarters at Casper, Wyo., was reported in the June issue, was born in Chicago on November 9, 1908. He received a degree in civil engineering from the

(Continued on page 872)

Railway Personnel (Cont'd)

M.chigan College of Mining and Technology in 1931, and entered railroad service with the Burlington in August, 1934, serving thereafter as rodman and instrumentman at various locations. In July, 1937, Mr. Owens was advanced to assistant roadmaster at Denver, Colo., and in January, 1938, he was appointed acting roadmaster at Lincoln, Neb. Two months later he was appointed roadmaster at Orleans, Neb., and in September of that year he was transferred in the same capacity to South Sioux City, Neb. Mr. Owens was advanced to assistant engineer in June, 1939, serving in that capacity until his recent promotion to division engineer.

Frederick A. Hunt, whose promotion to division engineer of the Capreol division of the Canadian National, with headquarters at Capreal, Ont., was announced in the July issue, was born in Wentworth County, Ont., and is a graduate in civil engineering of Queen's University. He began service with the Canadian National in Toronto, Ont., in 1940, as a rail grinder's helper, and later became inspector on a rail testing car. After four years of service with the Royal Canadian Engineers, Mr. Hunt returned to the Canadian National in 1946 as assistant engineer at Toronto. Two years later, he was transferred to the Niagara, St. Catharines & Toronto Railway, at St. Catharines, Ont., in the same capacity. In 1949 he was appointed assistant division engineer, at Belleville, Ont., the position he relinquished to assume his new duties.

Milton P. Oviatt, whose promotion to division engineer of the Southern, with headquarters at Selma, Ala., was announced in the May issue, was born in West Haven, Conn., on October 21, 1915, and received a Bachelor of Science degree in civil engineering from Duke university in 1939. During the summers of 1937 and 1938 he worked in the maintenance of way department of the New York, New Haven & Hartford. Mr. Oviatt entered the service of the Southern in July, 1939, as a student apprentice. In April, 1942, he was appointed assistant to roadmaster at Somerset, Ky., and assistant bridge and building supervisor, at Birmingham, Ala., in November, 1942. He was promoted to bridge and building supervisor, at Hattiesburg, Miss., in March, 1944, and in September, 1949, was transferred, in the same capacity, to Lexington, Ky., where he served until his recent promotion.

Track

R. A. Harlow, roadmaster on the Smithers division of the Canadian National, at Prince George, B.C., has retired after 40 years of service.

J. H. Kramer has been appointed acting roadmaster on the Cedar Rapids division of the Chicago, Rock Island & Pacific, with headquarters at Oelwein, Iowa, succeeding **George Broderick,** whose death is reported elsewhere in this issue.

R. D. Ennis, general track foreman on the Kentucky division of the Illinois Central, has been promoted to supervisor of track, with headquarters at Princeton, Ky., succeeding **W. R. Pruitt.** Mr. Pruitt with headquarters remaining at Princeton, succeeds **R. C. Williams** who has retired.

J. M. Morgan, junior engineer on the Maryland division of the Pennsylvania, with headquarters at Perryville, Md., has been appointed assistant supervisor of track on the Susquehanna division, at Northumberland, Pa., succeeding **G. S. Lehman,** who has been transferred to the Philadelphia division, with headquarters at Lancaster, Pa.

Joseph R. Goodman, assistant supervisor of track on the Southern at Greenville, S. C., has been promoted to supervisor of track at Keysville, Va., succeeding **John W. McPherson,** who has been transferred to Charlottesville, Va. **Frank M. Amick,** supervisor of track at Shelby, N. C., has been transferred to Greenwood, S. C.

John S. Bradshaw, assistant roadmaster on the Norfolk & Western, at Williamson, W. V., has been promoted to roadmaster, at Portsmouth, Ohio, suc-

ceeding **M. W. Emmons,** whose death is reported elsewhere in these columns. **Walter S. Clement,** assistant roadmaster at Sardinia, Ohio, replaces Mr. Bradshaw, and **Edwin C. Smith,** inspector, office of manager roadway maintenance, Roanoke, Va., succeeds Mr. Clement.

R. E. Radcliffe, junior engineer on the Williamsport division of the Pennsylvania, with headquarters at Northumberland, Pa., has been promoted to assistant supervisor of track on the Columbus division. He succeeds **W. J. Nichols, Jr.,** who has been transferred to the New York division, with headquarters at New Brunswick, N. J. Mr. Nichols replaces **D. T. Lyons,** who has been transferred to the Eastern division, at Canton, Ohio.

C. B. Campbell, general foreman of track on the Illinois division of the Illinois Central, has been promoted to supervisor of track, with headquarters in Bloomington, Ind. He succeeds **J. D. Bogard,** who has been transferred to Gilman, Ind., where he replaces **J. F. Brosnahan.** Mr. Brosnahan, in turn, has been transferred to Sprringfield, Ill., to replace **P. A. Cosgrove,** who has been transferred to East St. Louis, Ill. Mr. Cosgrove succeeds **J. H. Megee,** whose appointment as assistant to division engineer is announced elsewhere in these pages.

Bridge and Building

Charles S. McElreath has been appointed assistant bridge and building supervisor on the Southern at John Sevier, Tenn.

J. B. O'Brien, carpenter foreman on the Chesapeake & Ohio, has been appointed assistant supervisor of bridges and buildings, with headquarters at Richmond, Va., succeeding **R. J. Cassidy,** whose appointment as supervisor of bridges and buildings of the Chicago division was noted in the July issue.

Special

E. R. Tattershall, superintendent of maintenance equipment on the New York Central, with headquarters in New York, retired on August 31.

Rogers A. Hostetter, inspector of maintenance of way roadway equipment of the Texas & New Orleans, has been promoted to supervisor of maintenance of way equipment and scales, with headquarters at Houston, Tex. He succeeds **Edward C. Jackson,** who has retired after 32 years of service. **Earnest C. Kearney,** assistant foreman maintenance of way repair shop, has been promoted to inspector of maintenance of way roadway equipment to succeed Mr. Hostetter.

Mr. Hostetter entered the service of the T.&N.O. in 1930 as a welder helper. He was promoted to roadmaster in 1943 and to inspector of maintenance of way roadway equipment in 1945.

Mr. Jackson began his railway career as chief clerk, weighing bureau, on the St. Louis-San Francisco, at Springfield, Mo., in 1911. He joined the T.&N.O. in 1918 as supervisor of scales and was appointed supervisor of maintenance of way equipment and scales in 1931.

Obituary

George Broderick, roadmaster on the Cedar Rapids division of the Chicago, Rock Island & Pacific, with headquarters at Oelwein, Iowa, died recently.

M. W. Emmons, roadmaster on the Scioto division of the Norfolk & Western, with headquarters at Portsmouth, Ohio, died on June 17.

Charles F. Losh, retired valuation engineer of the Norfolk & Western, died on June 19.

William V. Walters, retired track supervisor on the Central of Georgia, died on March 23, at Millen, Ga.

E. M. McCullough, supervisor of bridges and buildings on the New York Central, at Corning, Ohio, died recently.

Michael J. Sullivan, retired roadmaster on the Kenora division of the Canadian Pacific, died recently.

George M. Rowe, assistant division engineer on the Southern Pacific, with headquarters at Oakland, Cal., died on June 19.

(Please turn to page 874)

Association News

Track Supply Association B.&B. Supply Men's Association

The Track Supply Association will hold its annual meeting in the Grand Ballroom of the Coliseum, Chicago, at 10:00 a.m., September 19, at which time an election of officers will be held, and other business will be transacted. This room is located on the second floor of the Coliseum at the south end of the building. The Bridge and Building Supply Men's Association will hold its annual meeting at 11:00 a.m. in the same place and on the same date.

American Railway Engineering Association

A total of 13 committees has scheduled meetings to be held in September, of which 11 will hold their meetings at the Hotel Stevens, Chicago, during the concurrent conventions of the Roadmasters' Association and the American Railway Bridge and Building Association, September 18-20. These 11 committees include those on Rail, which will meet on September 19-20; Track, September 20; Buildings, September 19; Wood Bridges and Trestles, September 18; Masonry, September 18-19-20; Highways, September 19-20. Yards and Terminals, September 18-19-20; Uniform General Contract Forms, September 19-20; Economics of Railway Labor, September 21; and Maintenance of Way Work Equipment, September 18-19.

As part of their meeting the Committee on Masonry will visit the new laboratories of the Portland Cement Association at Skokie, Ill., on September 20. The Committee on Economic of Railway Labor has also scheduled an inspection trip during September. Sub-committee 2 of this committee, and other members who wish to do so, will observe operations of yard-cleaning equipment on the Elgin, Joliet & Eastern on September 20.

Other committee meetings scheduled for September include those on Water Service and Sanitation, which will meet on September 19 at the association headquarters, and Economics of Railway Location and Operation, which will meet at the Union League Club, Chicago, on September 26.

Meetings and Conventions

American Railway Bridge and Building Association—Annual meeting, September 18-20. 1950, Hotel Stevens, Chicago. Elise LaChance, Secretary, 431 S. Dearborn Street, Chicago 5.

American Railway Engineering Association—Annual Meeting, March 13-15, 1951, Chicago. Neal D. Howard, Secretary, 59 E. Van Buren street, Chicago 5.

American Wood-Preservers' Association—Annual meeting, April 24-26, 1951, Stevens Hotel, Chicago. H. L. Dawson, Secretary-treasurer, 839 Seventeenth Street, N. W., Washington 6, D. C.

Bridge and Building Supply Men's Association—E. C. Gunther, Secretary, 122 S. Michigan Avenue, Chicago 3.

Maintenance of Way Club of Chicago—E. C. Patterson, Secretary-treasurer, Room 1512, 400 W. Madison street, Chicago 6.

Metropolitan Maintenance of Way Club—Walter L. Turner, Jr., Secretary, 30 Church street, New York.

National Railway Appliance Association—R. B. Fisher, Secretary; Lewis Thomas, assistant, Secretary 59 E. Van Buren street, Chicago 5.

Railway Tie Association—Roy M. Edmonds, Secretary-treasurer, 610 Shell Building, St. Louis 3, Mo.

Roadmasters' and Maintenance of Way Association of America—Annual meeting September 18-20, 1950, Hotel Stevens, Chicago. Elise LaChance, Secretary, 431 S Dearborn street, Chicago 5.

Track Supply Association—Lewis Thomas, Secretary, 59 E Van Buren street, Chicago, 5.

Supply Trade News

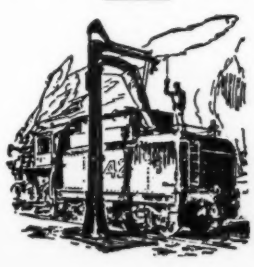
Personal

The **McCulloch Motors Corporation,** Los Angeles, Cal., has announced the appointment of **Lewis S. Peck** as personnel manager.

The Flintkote Company, New York, has announced the appointment of **Harold D. McAneny,** as director of advertising.

Gilbert E. Webster, formerly vice-president and director, has been elected president of the **National Lock Washer Company,** Newark, N. J.

The **Caterpillar Tractor Company,** Peoria, Ill., has appointed **H. J. Hunkle, Jr.,** as assistant manager of its sales engineering division.



A. E. Botts, retired assistant chief engineer of the Chesapeake & Ohio, has joined the **F. Burkart Manufacturing Company** as sales representative in the Richmond (Va.) territory.

The **Dearborn Chemical Company,** Chicago, has announced the appointment of **Lester R. Sagar** as process manager. He will have supervision of production planning and the development of process equipment.

Jean St. Henri and **Kenneth Mulkey** have been promoted to factory sales representatives of the **McCulloch Motors Corporation,** Los Angeles, Cal. Both of these men were formerly employed in the service department of the company.

The board of directors of the **Golden Anderson Valve Specialty Company,** Pittsburgh, Pa., has announced the election of **Grant A. Colton** as vice-president and general manager. Mr. Colton has served as assistant manager of the company since 1934.

A. Paul Selby, has been appointed assistant to the sales vice-president of the **United States Steel Corporation of Delaware.** He was formerly assistant

(Continued on page 876)

Supply Trade News (Cont'd)

general manager of sales of the Carnegie-Illinois Steel Corporation, a subsidiary of the United States Steel Corporation.

The **Reade Manufacturing Company, Inc.,** Jersey City, N.J., has announced the appointment of **Charles R. Sherman** as assistant to the president. Mr. Sherman is a native of Indiana and received his college training at Indiana University. During World War I he held the rank of captain and was in charge of purchasing at Jeffersonville Quartermaster depot. He brings to his new assignment a wide experience in the chemical field, having been employed by the R. M. Hollingshead Company, Camden, N.J., serving as vice-president. He resigned from this company to accept the position of vice-president of the Ault and Wiborg Company, Cincinnati, Ohio, a subsidiary of the International Printing Ink Corporation. Mr. Sherman then served for 13 years in various capacities with the Sun Chemical Corporation, and in 1946 was elected treasurer, with jurisdiction over all purchasing and contract work. In December, 1948, he resigned from Sun Chemical to engage in sales and management consulting work.

Charles R. Sherman

Walter F. Winters, special projects engineer of **The Asphalt Institute,** with headquarters at Denver, Colo., has been promoted to chief engineer, with headquarters at New York. **Bernard Gray,** president of the institute, who formerly seved also as chief engineer, has relinquished the latter post to devote all of his activities to the office of president.

Koppers Company, Inc., Pittsburgh, Pa., has announced the appointment of **Dr. E. W. Volkmann** and **Dr. F. L. Jones** as assistant manager of the research department. Dr. Volkmann has been assigned responsibility for the laboratory and development section of the depart-

ment, and Dr. Jones will supervise the research administration and patents sections.

Charles H. Jones has been appointed assistant traffic manager of the **Texas Company,** with headquarters at New York. Mr. Jones joined the company as a rate clerk in March, 1929. He advanced through various positions in the railway traffic and sales department until his appointment as assistant to traffic manager, the position he held at the time of his recent promotion.

Trade Publications

(To obtain copies of any of the publications mentioned in this column, use postcards, page 807)

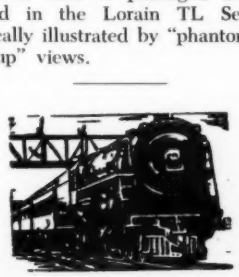
Gradall Catalog—The Warner & Swasey Company has published an illustrated catalog, designated as No. 4903, on the latest model of the Gradall earthmover. Included in the catalog are specifications and operating views of the unit.

International Crawler Tractor—The International Harvester Company has announced a 24-page catalog describing the new International TD-18A crawler tractor. Printed in two colors, the catalog contains pictures, sectional views and diagrams illustrating the features of the machine.

Armco Cold-Rolled Paintgrip – The Armco Steel Corporation has issued a 12-page illustrated guide book for users of Paintgrip—an electrically zinc-coated and Bonderized sheet metal. Included in the booklet are recommendations for storing, forming, welding, cleaning and painting the material.

"Wolmanized" Pressure-Treated Wood—The American Lumber & Treating Co., has published a 44-page report covering 25 years of service records for "Wolmanized" pressure-treated lumber. This report, the third in a series started in 1941, cites case histories of more than 55,000,000 board-feet of treated material in service and lists 581 specific installations where the wood has been used. Many of these installations are illustrated.

Lorain Shovels and Cranes—The Thew Shovel Company has published a catalog devoted to the Lorain TL Series of power shovels and cranes. This series is comprised of machines in the ½-yd. and ¾-yd. classes, mounted on a wide variety of crawler and rubber-tire mountings. It includes self-propelled and Moto-Crane models. The interchangeable unit or packaged assembly featured in the Lorain TL Series is graphically illustrated by "phantom" and "built-up" views.



Roof Protection—A four-page folder, entitled Protect That Roof—It's Good Insurance, has been published by United Laboratories, Inc. This literature describes the roof troubles caused by structure movement, sun, wind, rain and snow, and explains tested methods to combat them. It discusses methods of eliminating difficulties in such areas as flashings, laps, seams, and coping stones.

Stainless-Steel Curtain Walls—The Allegheny Ludlum Steel Corporation has published a 24-page booklet presented as a progress report on proposed methods of curtain-wall construction in which prefabricated sections of stainless steel sheathing backed by insulating material would replace masonry or other materials in the construction of exterior walls of buildings. Scale drawings are employed in the booklet to illustrate existing and planned types of stainless-steel curtain walls with specific attention given to such details as facings, insulation, joints, vents, window sections, and shapes and texture.

Underground Pipe Insulation—The Zonolite Company has announced that a newly revised version of its brochure —Z—Crete Underground Pipe Insulation —is now ready for distribution. This publication fully describes and illustrates the method of insulating underground steam, oil or hot-liquid lines with a continuous system of Z-Crete—a lightweight, resilient concrete.

(Please turn to page 878)

Trade Publications (Cont'd)

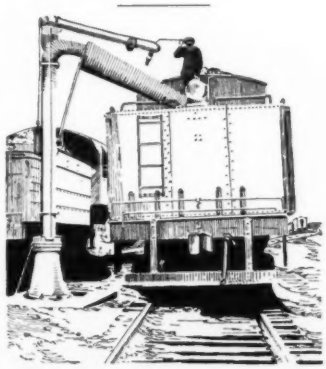
Link-Belt Drives—Link-Belt P.I.V. variable-speed drives in 8 sizes and 16 types, in capacities of ½ hp. to 25 hp., with manual and automatic controls, are illustrated, listed and described in a new 88-page booklet, designated as No. 2274, published by the Link-Belt Company. A special feature of the book is a section devoted to "preselected drives" from which a P.I.V. of the right specifications for a specific service may be selected directly.

Dixon Paints and Primers—The Joseph Dixon Crucible Company has recently issued two circulars on the applications of Dixon silica graphite paints and primers. One of these discusses general applications of the paints for protecting any exposed metal surface against rust. The other presents detailed information and specifications on the use of the material for painting water tanks.

Caterpillar Tractor—The Caterpillar Tractor Company has issued a folder on the Caterpillar Diesel DW-10 Diesel tractor. In addition to the specifications of the unit, and of matched equipment—the No. 10 scraper and the W-10 bottom dump wagon—the folder presents a large cutaway drawing of the tractor showing in detail its design features and construction.

Blue Brute Concrete Mixer.—The Worthington Pump Machinery Corp., has issued a new Bulletin, No. B-1700-B2, describing current models of Worthington-Ransome Blue Brute big concrete mixers for use at central mixing plants or on large construction jobs. Attachments and accessories, such as a hydraulic control system, are illustrated, and complete specifications and dimensions are given.

Synchronous Motors—A new eight-page, two-color, illustrated bulletin on Tri-Clad high-speed synchronous motors has been published by the General Electric Company. Designated as publication GEA-5426, the bulletin lists some of the applications of the motors, gives three typical installation stories, describes Tri-Clad protection, and discusses the construction features and mechanical modifications of the motors.

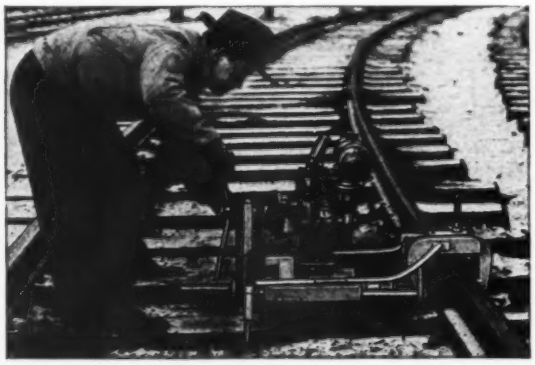


SERVICE MORE TRACK IN LESS TIME FOR LESS MONEY - -

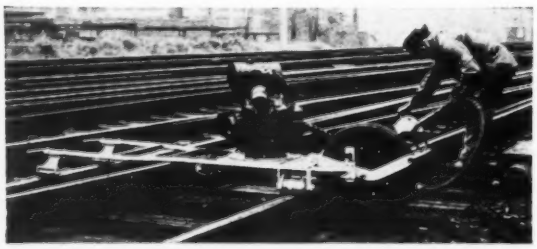
WITH SPEEDY, EASY-OPERATING RTW DRILLS AND GRINDERS

Low-cost, low manpower RTW Drills and Grinders speed up your maintenance work . . . enable you to keep rails shipshape without crowding your track gangs . . . and save you money to boot!

Two popular RTW maintenance machines are shown below—others available also give you labor-saving advantages at substantial savings.



RTW'S MODEL P-43 POWER TRACK DRILL gives you 60-second drilling . . . quick, accurate drill-leveling . . . easy-acting, easily-controlled screw feed . . . easy-handling (aluminum castings keep weight down to 125-lbs.) . . . quick on/and/off-rail action . . . chuck jaws that take beaded bits up to 1½" and automatically stay open when chuck is loosened.



RTW'S MODEL P-44 PORTABLE FLEXIBLE SHAFT GRINDER is designed to give you added savings in labor and costs when you lay new track or repair old.

Grinder's 360° swivel engine mount prevents short bends and kinking of flexible shaft . . . clutch assembly in the engine protects shaft from overload . . . three position wheel clears switches and crossovers easily . . . light and compact, it gets on and off the track fast . . . quickly adaptable for auxiliary equipment: Straight Wheel Hand Piece, Angle Hand Piece for Cup Wheel, Cross Grinder Guide and Track Drill.

Write today for further information on the P-44 Portable Flexible Shaft Grinder, the P-43 Power Track Drill and other easy-to-operate RTW equipment. 5-58

Railway Trackwork Co.

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Distributors for

Burro Cranes	McCulloch Chain Saws
Dapco Sprayers	THOR Electric Tools
LeRoi Air Compressors	Wayer Impactors

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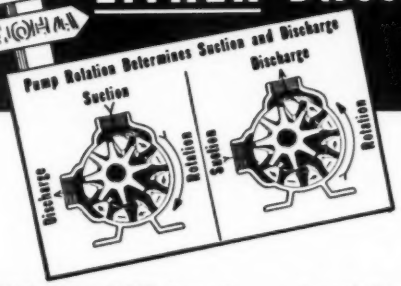
DON'T RISK A CHANCE OF BEING CONFUSED!

VIKING ROTATES in EITHER Direction



With Equal Efficiency! . . . Equal Accuracy!

You merely reverse rotation of pump shaft to reverse flow of liquid in the Viking Rotary Pump. Figure at left shows pump with TOP SUCTION and SIDE DISCHARGE . . . at right, after reversing, SIDE SUCTION and TOP DISCHARGE. Simple and practical isn't it? And this flexible, time-saving feature makes Viking the ideal pump for fuel and lubricating oils. Bulletin 50SY shows you how the "2 in 1" Viking Pump can cut pumping costs and time. Write for a copy.

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AN HONORED NAME IN PUMPING

See Our Catalog in SWEETS

Viking PUMP COMPANY
Cedar Falls, Iowa

Use Q and C Manganese Guard Rails

For Safety and Economy

The rugged construction of Q and C Guard Rails assures strength, safety and economy. The simplicity of the design in one piece means a minimum of man hours for both installation and maintenance, resulting in a saving of labor that reduces costs.

The Q and C Guard Rails have a heavy solid head that is well braced to resist the thrusts of the heaviest equipment, and are made of full manganese wear resisting steel, and provided with a self-cleaning feature to prevent the accumulation of cinders, snow or ice.

Specify Q & C Guard Rails on your requisitions.

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Double-Life
SEALED-TITE IN ZINC

All Sealtite products are offered in our thick, double-life, hot dipped galvanized finish. As the name implies, the service life of the bolt is lengthened saving replacement costs and assuring freedom from fastener corrosion. Actual experience tests prove the economy of using Double-Life Sealtite Products.

LEWIS BOLT & NUT CO., 504 Malcolm Ave. S.E., Minneapolis

Designed and Engineered
FOR RAILWAY USE

SAVE - time - expense - manpower

with the AGRICAT

Cleans under bridges and large culverts, in ditches and cuts, between tracks or between rails. Cleans coal spillage, cinders, sand. Pulls cable. Digs firebreaks. Back-fills. Levels dirt and weeds on berm outside ballast section; cuts away cinder and gravel ballast; disks shoulder ballast. Cleans snow from platforms and drives and narrow congested areas. Pushes 9 cu. ft.

DIMENSIONS:

Width—38 in.

Length—58 in. tractor only; 6 ft. with dozer

Height—41 in.

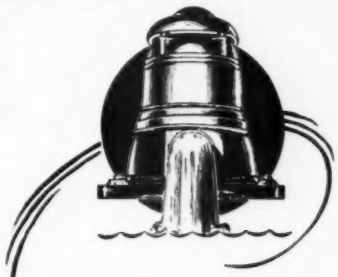
Weight—1170 lbs. tractor only

Engine—8½ h. p. air-cooled Briggs & Stratton

Treads—steel or rubber

See us at BOOTH 46, Chicago Coliseum, September 18-20

EARL H. PENCE & CO., Inc.
2150 Washington Ave., San Leandro, Calif.



Tops in Value

Here is America's top value in a Well Water System—value that comes from years and years of careful study, much experiment and the final solving of just what metals are best for each part of the pumping equipment. This is the Water System that has made good in all parts of the world and under all kinds of conditions. This is the kind of a system that will give you the utmost satisfaction. Write for catalogs.

LAYNE & BOWLER, Inc.
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LAYNE
WELL WATER SYSTEMS
VERTICAL TURBINE PUMPS

Cut Costs, Speed Work

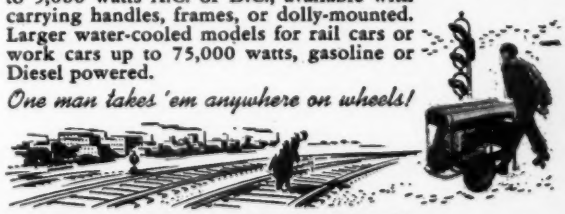
on Construction and Maintenance Jobs!

with **ONAN** *Portable* **ELECTRIC PLANTS**

5 KW D.C. model with carrying frame.

Take an Onan portable electric plant to every right-of-way maintenance or construction job! It will supply quick "plug-in" electric power for cost-cutting, fast-working electric tools—drills, saws, nut runners, grinders, pipe threaders or any motor-driven equipment. Lightweight models from 400 to 5,000 watts A.C. or D.C., available with carrying handles, frames, or dolly-mounted. Larger water-cooled models for rail cars or work cars up to 75,000 watts, gasoline or Diesel powered.

One man takes 'em anywhere on wheels!



Write for folder showing complete range of A.C. and D.C. models.

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ALPHABETICAL INDEX TO ADVERTISERS, SEPTEMBER, 1950

Maintenance of track is as vitally important in retarder yards and terminals as maintenance of the mainline track.

Throughout the country, along thousands and thousands of miles of finely laid track, Improved Hipowers, with their great reserve of spring power, are a tremendous help in this ceaseless job of careful maintenance.

THE NATIONAL LOCK WASHER COMPANY, NEWARK 5, N. J., U. S. A.

A COMPLETE LINE OF RAILWAY SPRING WASHERS

THE COST-SAVING BALLAST FOR HARD-TO-DRAIN TRACK

. . . is coated stone ballast with TEXACO ASPHALT

Reduce other maintenance costs, too

Use Texaco Rail Joint Lubrication to prevent freezing, kinking and corroding. Easily applied under traffic without taking down joints.

Use Texaco No. 24 Emulsified Asphalt for your grouting mixtures to eliminate soft track. It assures longer-lasting stability.

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SAN FRANCISCO ★ ST. PAUL
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The picture shows ballast stone being coated with *Texaco Asphalt*. The small cost of this is repaid many times over by year-after-year savings in maintenance costs. This is the ideal ballast for station and other hard-to-drain track.

A coating of *Texaco Asphalt* waterproofs the ballast and enables it to shed moisture quickly . . . seals out fouling dirt and cinders.

In addition, *Texaco Asphalt* keeps the ballast flexible. It does not crack under traffic and can be tamped even after long service. Track stays in line and on grade for years with minimum attention.

To be sure of all these cost-saving advantages, be sure to specify *Texaco Asphalt*. Its superior qualities have been proved by more than 40 years of service on America's roofs, streets, highways and railroads.

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